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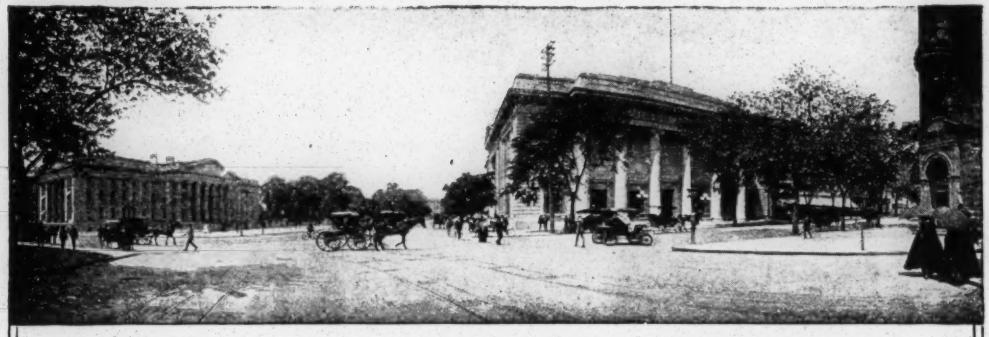

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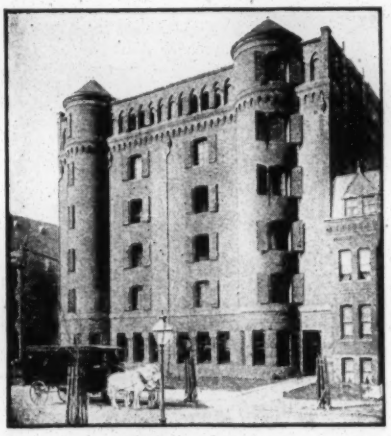

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VOL. XVIII, No. 5 WASHINGTON MAY, 1907

THE NATIONAL GEOGRAPHIC MAGAZINE

THE ROCK CITY OF PETRA*

BY FRANKLIN E. HOSKINS, D. D., OF BEIRUT, SYRIA

The first of a series of several articles describing rock-hewn edifices of antiquity

THE highlands east of the Jordan River are strewn with ruins marking the rise and fall of successive civilizations—Semitic, Greek, Roman, Christian, Mohammedan, and Crusader. These ruins have been preserved for the modern explorer by the tides of nomadic life, which have swept up from the Arabian desert; but at the southern end of this no-man's land, deep in the mountains of Edom, lies one of the strangest, most beautiful, and most enchanting spots upon this earth—the Rock City of Petra. Its story carries us back to the dawn of human history. When Esau parted in anger from Jacob he went into Edom, then called Mount Seir, and after dispossessing the Horites became the progenitor of the Edomites, who remained the enemies of the children of Israel for a thousand years. These Edomites had princes, or kings, ruling in the Rock City while the children of Israel were still in Egyptian bondage. Some of the darkest maledictions of the Old Testament prophets are those aimed at Edom.

A GREAT "SAFE DEPOSIT"

In the days of the Nabatheans, Petra became the central point to which the caravans from the interior of Arabia, Persia, and India came laden with all the precious commodities of the East, and from which these commodities were distributed through Egypt, Palestine, Syria, and all the countries bordering on the Mediterranean, for even Tyre and Sidon derived many of their precious wares and dyes from Petra. It was at that time the Suez of this part of the world, the place where the East and the West met to trade and barter. It was also in fact a great "safe deposit" into which the great caravans poured after the vicissitudes and dangers of the desert. Its wealth became fabulous, and it is not without some good reason that the first rock structure one sees in Petra, guarding the mysterious entrance, is still called "Pharaoh's Treasury." It must have been the Nabatheans who developed the natural beauties of the situation and increased the rock-cut dwellings and temples and tombs to the almost interminable extent in which they are found today.

The palmy period of the Nabatheans extended from 150 B. C. to 106 A. D., when the Romans conquered the country and city, extended two Roman roads into it, and established the province of Arabia Petra. The Rock City was always to

* An address to the National Geographic Society, December 21, 1906.

these regions and peoples what Rome was to the Romans and Jerusalem to the Jews. Horites, Edomites, Nabatheans, and Romans have all rejoiced and boasted in the possession of this unique stronghold and most remarkable city of antiquity.

When Rome's power waned and the fortified camps on the edge of the desert were abandoned, no doubt the soldiers were withdrawn from such cities as Petra. Then the Romanized Nabatheans or Nabatheanized Romans held their own against the desert hordes as long as they could, and went down probably about the same time as the Greek cities of the Decapolis (636 A. D.). From the time onward Petra's history becomes more and more obscure, and for more than a thousand years Edom's ancient capital was completely lost to the civilized world. Until its discovery by Burckhardt, in 1812, its site seems to have been unknown except to the wandering Bedouin.

THE SIK OR ENTRANCE DEFILE

The entrance to the Rock City is the most striking gateway to any city on our planet. It is a narrow rift or defile, bisecting a mountain of many-hued sandstone, winding through the rock as though it was the most plastic of clay. This sik, or defile, is nearly two miles long. Its general contour is a wide semicircular swing from the right to the left, with innumerable short bends, having sharp curves and corners in its general course.

The width of the Sik varies from twelve feet at its narrowest point to 35 or 40 feet at other places. Where the gloomy walls actually overhang the roadway and almost shut out the blue ribbon of sky, it seems narrower, and perhaps at many points above the stream the walls do come closer than 12 feet. Photographs of these narrower and darker portions of the defile are impossible. Only where the walls recede and one side catches the sunlight (see photo., p. 285) was it possible to secure any views that would reveal the actual beauties of the place. Then no camera could be arranged to take in the whole height of the canyon. The height of the perpendicular side cliffs have been estimated at from 200 to 1,000 feet. Heights, like distances, in this clear desert air are deceptive, but after many tests and observations we are prepared to say that at places they are almost sheer for 300 to 400 feet.

Seen at morning, at midday, or at midnight, the Sik, this matchless entrance to a hidden city, is unquestionably one of the great glories of ancient Petra. Along its cool, gloomy gorge file the caravans of antiquity—from Damascus and the East, from the desert, from Egypt and the heart of Africa. Kings, queens, and conquerors have all marveled at its beauties and its strangeness. Wealth untold went in and out of it for centuries, and now for over thirteen hundred years it has been silent and deserted.

PHARAOH'S TREASURY

The first time we picked our way into this matchless defile we wandered on amazed, enchanted, and delighted, not wishing for, not expecting, that anything could be finer than this, when a look ahead warned us that we were approaching some monument worth attention, and suddenly we stepped out of the narrow gorge into the sunlight again. There in front of us, carved in the face of the cliff, half revealed, half concealed in the growing shadows, was one of the largest, most perfect, and most beautiful monuments of antiquity—Pharaoh's Treasury (see photo, p. 286). Almost as perfect as the day it came from beneath the sculptor's chisel, fifteen hundred or two thousand years ago; colored with the natural hues of the brilliant sandstone, which added an indescribable element to the architectural beauty; flanked and surmounted by the cliffs, which had been carved and tinted in turn by the powers of nature; approached by the mysterious defile—it is almost overpowering in its effect.

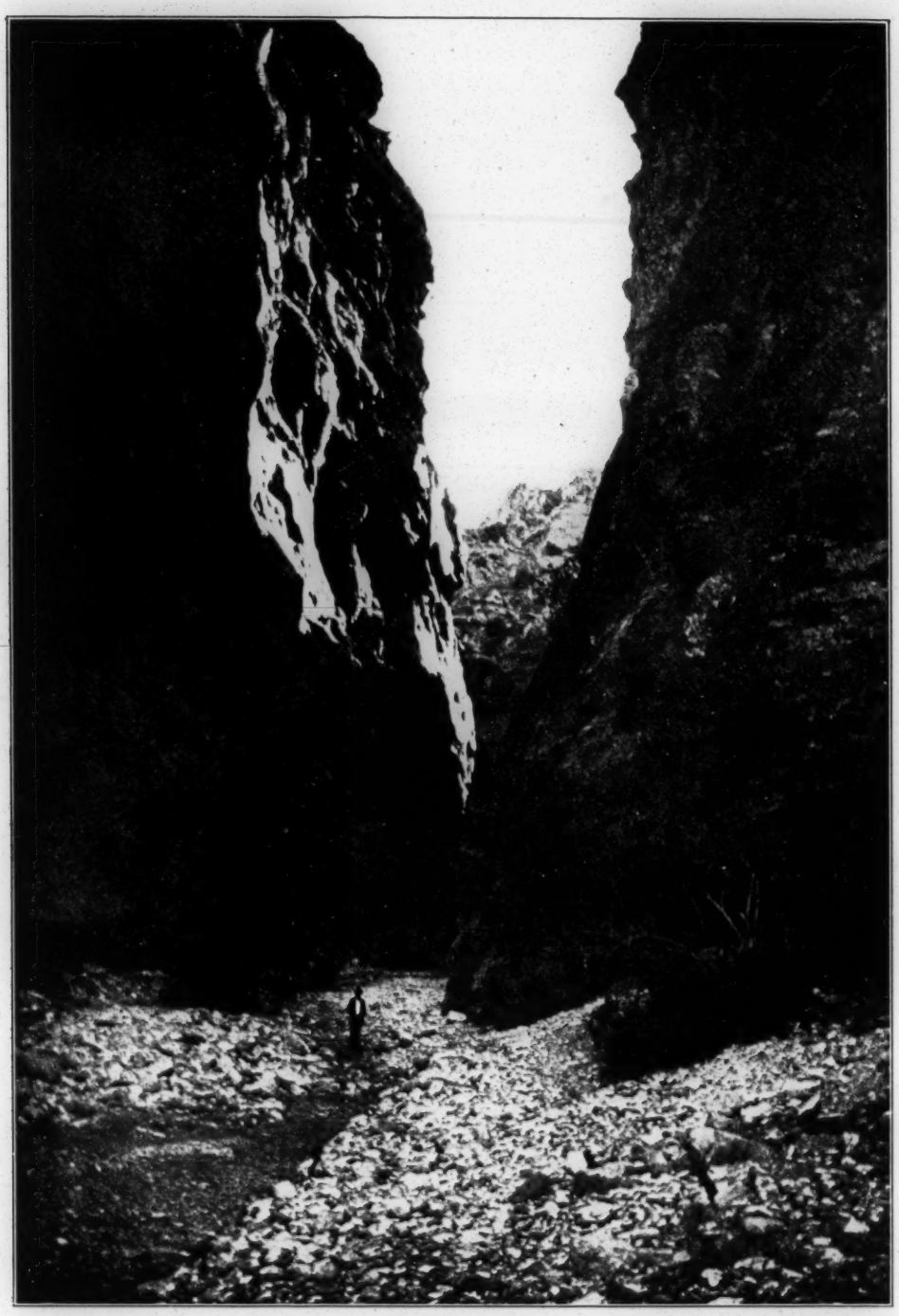
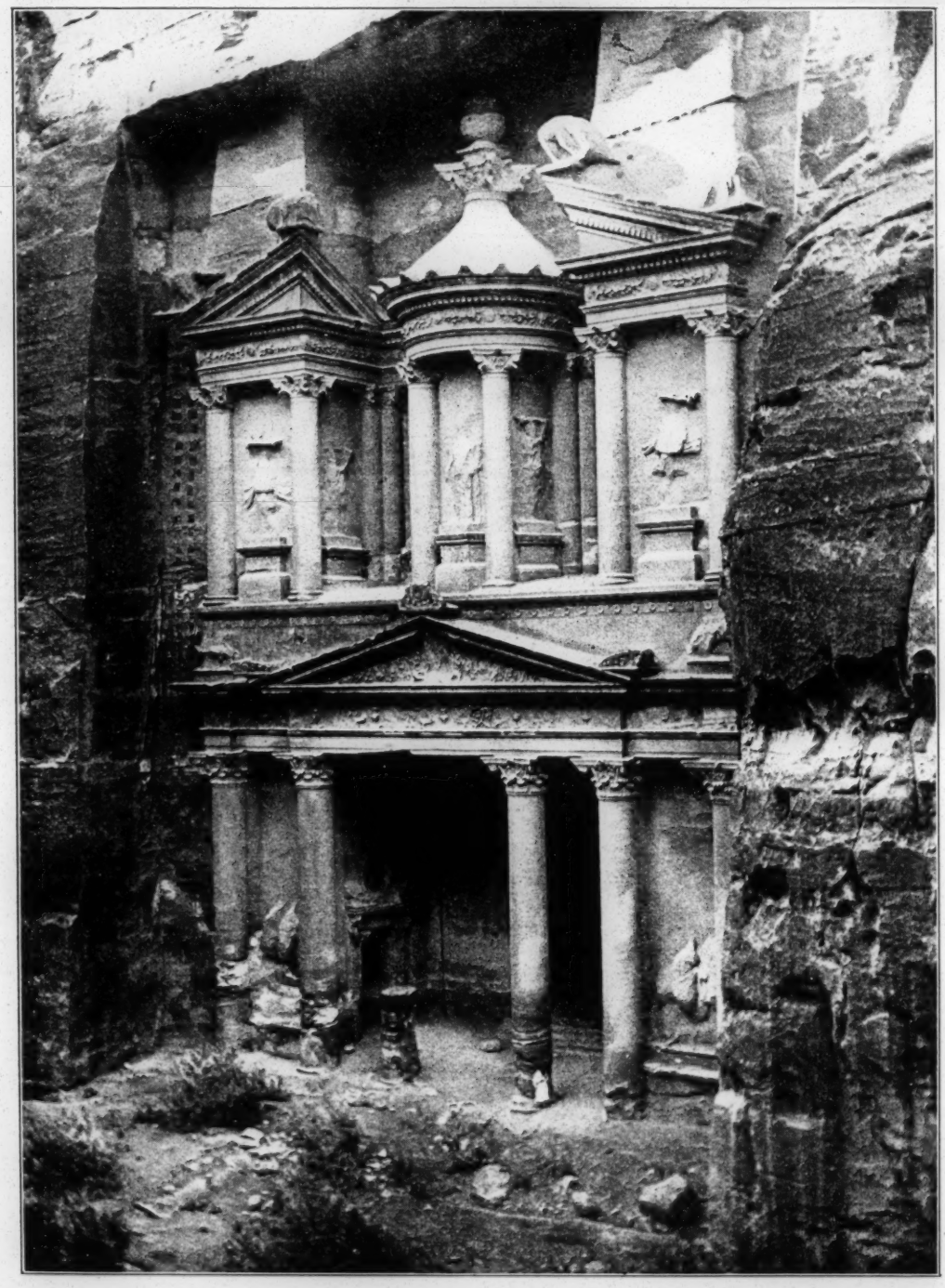


Photo by Libbey and Hoskins

Gorge of the Sik or Entrance to Petra

Where the rift widens out and makes a sharp bend to the left. Every person and everything entering the city—which numbered several hundred thousand inhabitants—was obliged to pass through this defile, which is nearly 2 miles long. Afterward, when the Romans came, they built two military roads over the mountains down to the city



Pharaoh's Treasury, Petra Photo by Libbey and Hoskins

The finest picture ever taken of this matchless monument of antiquity

Descriptions of the width and height and the details of this monument of antiquity may enable many to reproduce for themselves some of its striking features; but neither language, measurements, nor pictures can give more than a bald idea of the temple and its charming surroundings. The secret of its magic seems to be the culmination of man's best efforts with the powers and beauties of nature.

Located at the end of a long and difficult journey, whether one comes from the valley of the Euphrates, from Sinai, from Egypt, or from any point of Syria east or west of the Jordan; set in the mountains of mystery, at the gateway of the most original form of entrance to any city on our planet; carved with matchless skill, after the conception of some master mind; gathering the beauties of the stream, the peerless hues of the sandstone, the towering cliffs, the impassable ravine, the brilliant atmosphere, and the fragment of blue sky above—it must have been enduring in its effect upon the human mind. We saw it in its desolation, a thousand years after its owners had fled—tempest, flood, and earthquake having done their worst, aided by the puny hand of the wandering Arab, to mar and disfigure it—and we confess that its impression upon our hearts and memory is deathless.

To portray the marvelous coloring of these masses of sandstone and to give anything like a correct view of this unique feature of Petra is something we attempt with misgivings. From the moment we sighted the great castellated mass in which the city lies hidden until we took our last glimpse from the highlands above, we never ceased to wonder at the indescribable beauties of the purples, the yellows, the crimsons, and the many-hued combinations. Whether seen in the gloom of the Sik, or the brilliant sunshine, that seemed to kindle the craggy, bristling pinnacles into colored flames, they continued to inspire our surprise.

Travelers have vied with each other in their attempts to describe these beauties. After the solid colors of red, purple, blue, black, white, and yellow, the never-ending combinations are best compared with watered silk or the plumage of certain birds.

We shall be listened to if we say with all soberness that "the half was never told" of the effect of this many-hued landscape; for as we saw it glistening with the rain drops after the showers, we saw it before the sunrise, we saw it under the noonday sun, and we noticed, as perhaps no one had done before us, the way in which these ancient sculptors fixed the levels of their tombs and temples and dwellings so as to make most artistic use of the more beautiful strata in the mountain walls, and we marveled again and again, in the never-ending ravines, how these ancient dwellers consciously practiced a kind of landscape gardening, where, instead of beautiful effects produced by banks of fading flowers, all was carved from the many-hued and easily wrought solid stone, which took on new beauties as it crumbled away

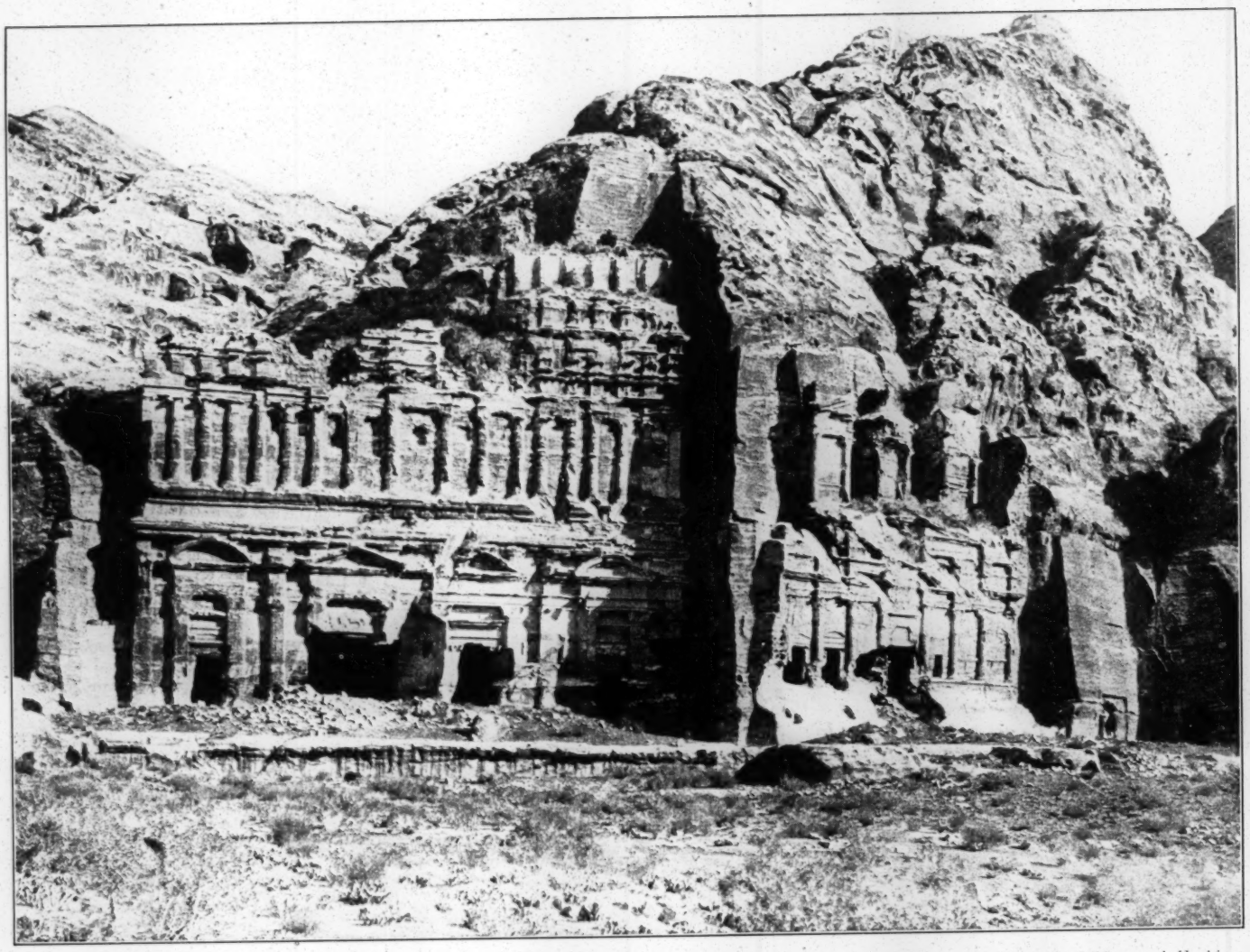
THE GREAT THEATER

Not far from Pharaoh's Treasury is a great theater (see page 288) cut in what may be called the Appian Way of the city. It stands among some of the finest tombs—a theater in the midst of sepulchers. The floor of the stage is 120 feet in diameter. Fully 5,000 spectators could have found comfort in the thirty-three rows of seats. Here also the coloring of the sandstone is brilliant, and at certain places in the excavation the tiers of seats are literally red and purple alternately in the native rock. Shut in on nearly every side, these many-colored seats filled with throngs of brilliantly dressed revelers, the rocks around and above crowded with the less fortunate denizens of the region, what a spectacle in this valley it must have been! What an effect it must have produced upon the weary traveler toiling in from the

Rock-hewn Theater at Petra

Photo by Libbey and Hoskins

Seating 5,000, where seats are rainbow hued, 300 feet in diameter, and 130 feet from floor to top of cutting. Note the figure of a man standing in amphitheater



Corinthian Tomb and Temple

Photo by Libbey and Hoskins

The finest location in the city and most beautifully colored. Carved out of solid rock, no placed stones or cement or mortar being used

Photo by Libbey and Hoskins

The Dier, or Monastery, Petra

Notice the figures in the doorway, which is 30 feet high, and the single figure on the cupola, 100 feet above

burning sands of the desert, along the shadows of the marvelous Sik, past the vision of the Treasury, and into the widening gorge that resounded with the shouts of the revelers, in the days of its ancient glory.

The eastern wall of the valley, near the entrance, rises to a height of more than five hundred feet. For a length of a thousand feet the face of the cliff is carved and honeycombed with excavations to a height of three hundred feet above the floor of the valley.

Here are found some of the most impressive ruins in the city. The Urn tomb in the center has in the rock behind it a room over 60 feet square, whose beautifully colored ceiling can be compared to a great storm in the heavens. The Corinthian tomb and temple (see p. 289) are among the largest and most beautifully colored monuments in any of the walls.

The Deir is reached by one of the great ravines up which winds a path and stairway until an elevation of 700 feet is attained. A small plateau opening toward the south gives an extended view of Mount Hor and all the southern end of the Dead Sea cavity. The spot is wholly inaccessible except by the one rocky stairway and winding path.

The Deir is carved from the side of a mountain top, but not protected by any overhanging mass. It is larger than the Treasury, but not nearly so fine in coloring or design. It is impressive in its size and its surroundings, but cannot be called beautiful.

Finally, if you will remember that originally the whole valley, from its beginning at the door of the Sik until its exit among the fissures at the southern end of the Dead Sea, is one huge excavation made by the powers of nature, the torrent and the earthquake; and that the hand of time, the frost, the heat, and the tempest have been busy through the ages cracking, smoothing, chiseling mountain top, deep ravine, and towering cliff into a myriad of fantastic forms, and that the subtler, silent agencies of Nature's alchemy have been adding the most brilliant hues to moldering sandstone strata, you cannot but be charmed and amazed at the result of her handiwork.

Then when you enter the city by the winding valley of the Sik, gaze at the stupendous walls of rock which close the valley and encircle this ancient habitation, and mark how man himself, but an imitator of Nature, has adorned the winding bases of these encircling walls with all the beauty of architecture and art—with temple, tomb and palace, column, portico and pediment—while the mountain summits present Nature in her wildest and most savage forms, the enchantment will be complete, and among the ineffaceable impressions of your soul will be the memories of this silent, beautiful "rose-red city half as old as time."*

* For further information on this remarkable city the reader is referred to *The Jordan Valley and Petra*. By William Libbey, Sc. D., and Franklin E. Hoskins, D.D. Two volumes. Vol. I, XV and 353 pp. and 74 illustrations. Vol. II, VIII and 380 pp. and 85 illustrations, 7 appendices, index, and map. G. P. Putnam's Sons, New York, 1905.

RECLAIMING THE SWAMP LANDS OF THE UNITED STATES*

By Herbert M. Wilson, U. S. Geological Survey

THE available agricultural lands of the United States have nearly all passed into private ownership, and the larger portion is under cultivation. With rapidly growing population and greater demand for agricultural products, the need of additional farm land grows apace. Similar influences resulted a few years ago in the creation of the Reclamation Service for developing the water supply available for irrigating the arid lands. It is believed that the maximum area which has been brought under cultivation by irrigation approximates 8,000,000 acres, and it is estimated that there has been brought into agricultural use by drainage areas equal to if not in excess of those so developed by irrigation. Further, while the area estimated by the Reclamation Service as possible of reclamation by irrigation within the next quarter century may not exceed 12,000,000 acres, it appears equally probable that the areas of existing swamp lands of the United States which may be made available for agricultural uses by drainage exceed those which may be reclaimed by irrigation, providing the drainage works were undertaken by the Federal Government with vigor equal to that devoted to irrigation reclamation.

As agricultural lands are becoming more scarce and the people of the country have seen what the government can do in bringing water to the barren deserts of the West, they realize that the same government might be equally successful in removing a superabundance of water. They are beginning to appreciate as never before the patent fact that waste swamp lands may be rendered not only habitable, but more productive than less fertile neighboring lands naturally drained. Now that the federal government is expending millions of dollars annually for the reclamation of the desert lands of the arid West through the agency of irrigation, those of us who live in more humid regions are beginning to regard the vast swamps of the Missouri and Mississippi valleys and their tributaries, and those of Florida and the Atlantic coast, and of the Sacramento Valley of California as the only large areas of possible agricultural lands remaining undeveloped.

MANY SWAMPS IN THE UNITED STATES CAN BE RECLAIMED

In the United States are over 60,000,000 acres of swamp or overflowed lands. Let us speculate on what drainage of one-half of this may mean. If it were possible to reclaim by drainage 25,000,000 acres of these swamps, the land values of the country would be increased by more than $2,500,000,000 and the crop values of these sections by more than $750,000,000. If it is possible to subdivide this enormous area into forty-acre farms, it will supply 1,250,000 families with homes, and it would put 6,000,000 people upon lands that are now practically worthless. It is safe to say that each of these families will spend $2,000 in houses and in equipments for their farms. This will cause the expenditure on the waste land of today of more than $2,500,000,000. An average family of five will spend $600 per year. This will mean to the business interests of the United States an increased trade of $750,000,000.

The Senate Committee on Public Lands of the 59th Congress reported favorably a federal drainage bill which, if enacted into law, will eventually produce results not differing far from the above, which now appear but an enthusiast's dream.

*An address to the National Geographic Society, February 22, 1907

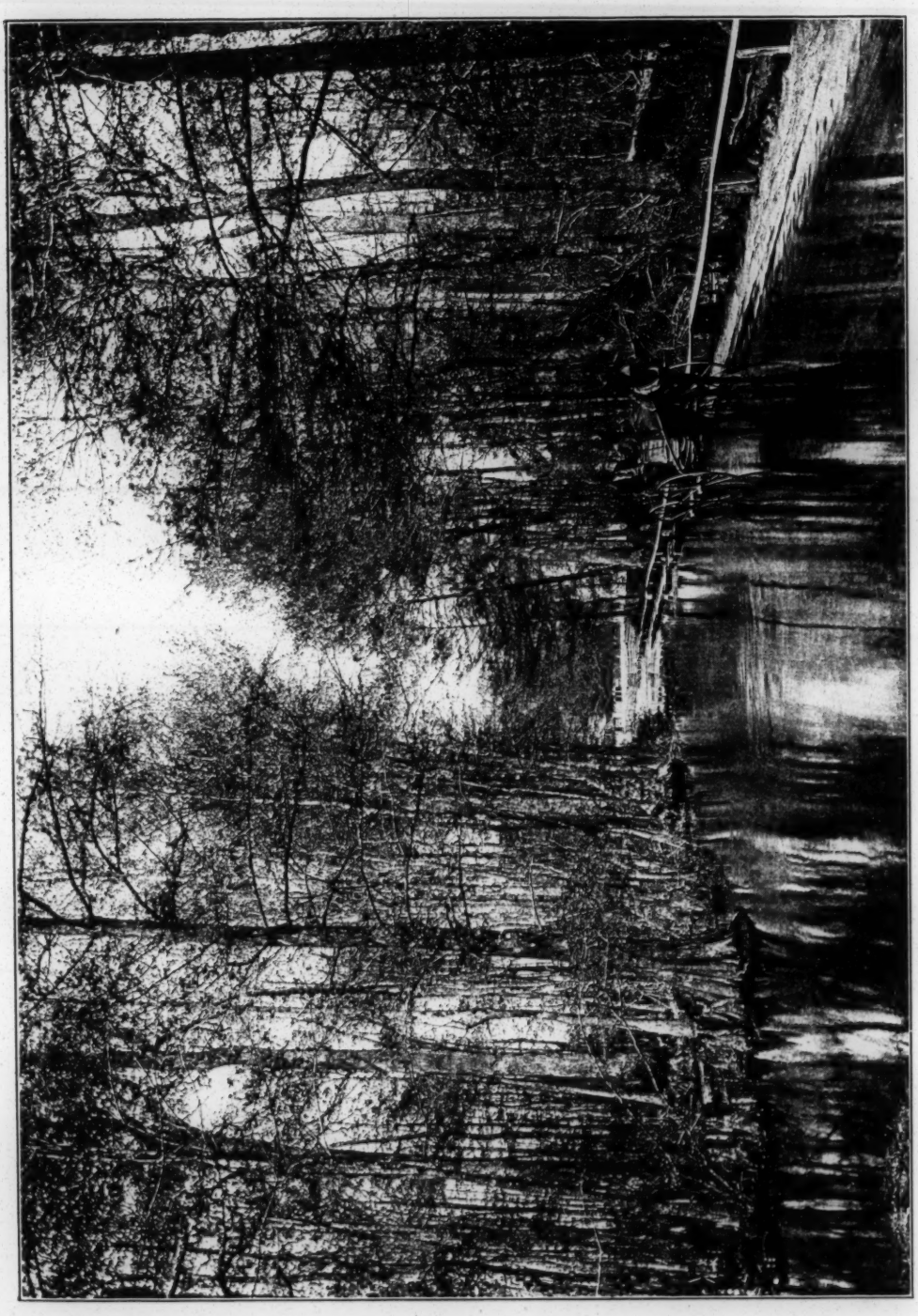
When the Reclamation Service came into existence, in 1902, it found ready-made a vast amount of essential preliminary information in the topographic maps of the United States Geological Survey. A study of these maps showed at once possible opportunities for creation of reservoirs for water storage and the relation of these and of perennial water supplies to irrigate lands. The engineers were thus enabled within a few months to segregate a number of important projects and put into the field large forces upon the preparation of the detailed plans for construction. To the existence of these topographic maps is to be credited much of the glory of the prompt achievement of the Reclamation Service. Now, five years later, there is available an even larger amount of the topographic mapping so essential as preliminary information to the detailed study of drainage projects. Upon the existence of this data and its intelligent use will depend much of the success of such swamp reclamation as may be undertaken for the whole country on broad and economic lines.

ONE-THIRD OF THE UNITED STATES HAS BEEN MAPPED IN GREAT DETAIL

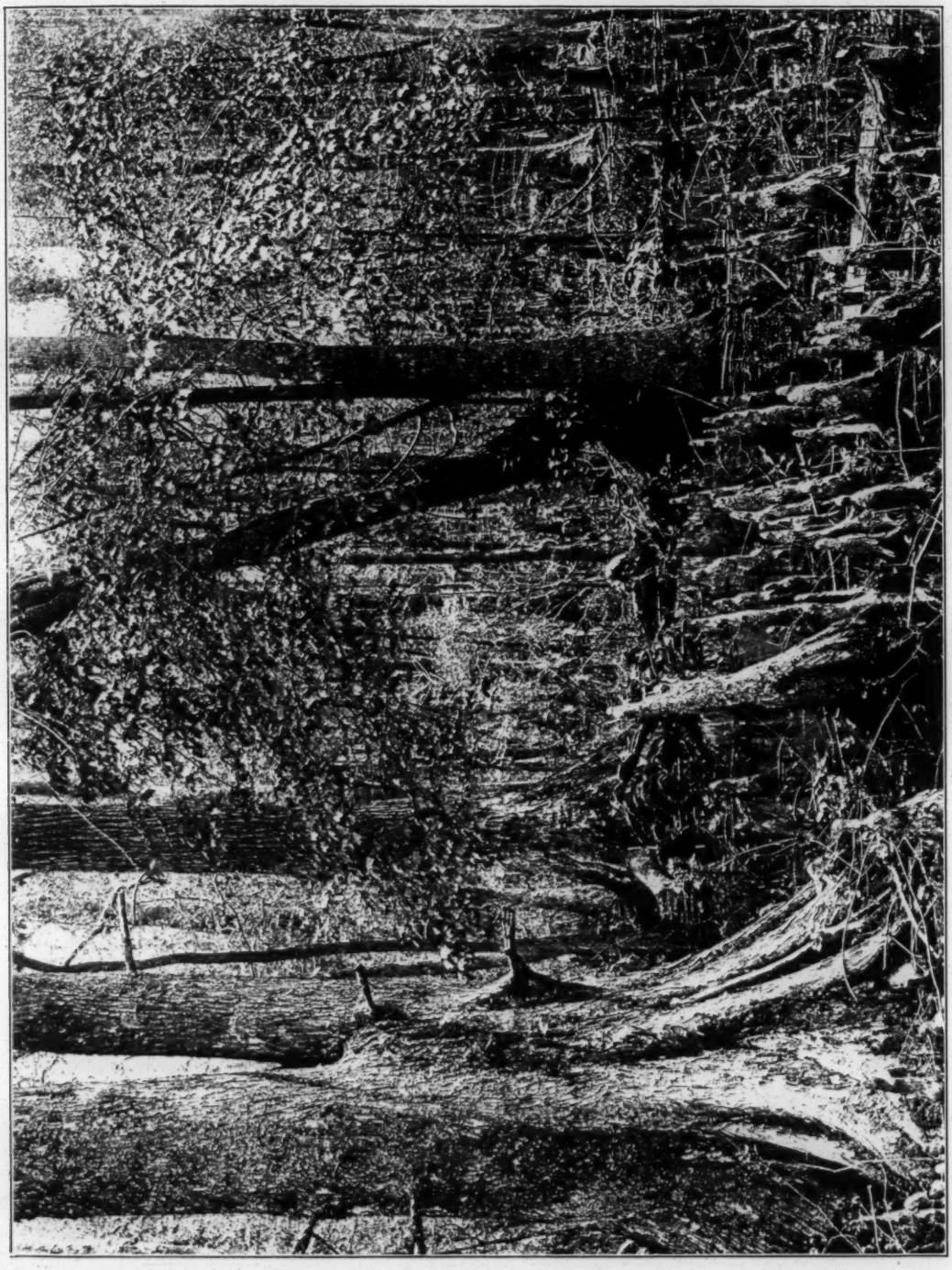
Topographic mapping has been completed in either preliminary or final form for nearly one million square miles, or almost one-third of the area of the United States. All of the mapping of recent years has been executed in great detail, in the course of which many thousands of miles of spirit levels have been run, from which permanent marks have been left, and the resulting data furnishes a vast amount of important engineering information concerning the slopes and the drainage of the surface of the land. These maps show where the swamps occur and their relation, both in distance and position, to natural drainage channels. Far more important than this, however, their inspection shows, on close scrutiny, all the facts of importance relative to the altitude of the swamps as referred to the surrounding hills and the drainage channels. It is evident, therefore, that a study of these maps shows where the swamps of the country lie, their extent, and furnishes in a preliminary way essential information as to the possibility of draining them. These maps do not furnish the engineering data needed in the location of an artificial drainage system nor in the making of estimates for construction, but they leave to the engineer only the necessary field inspection and more detailed location and construction surveys essential before definite plans and estimates can be prepared. Had such maps been in existence in the earlier days of discussion of such drainage projects as the Kankakee marshes of northern Indiana and of the tule lands of the Sacramento Valley, many hundreds of thousands of dollars wastefully expended in ill-digested drainage schemes might have been saved and useful works constructed where nothing has yet been accomplished.

The most important feature of any great engineering study covering a widely extended territory, is the preliminary examination which furnishes all the data essential to a complete understanding of every possible means of accomplishing the end sought. Hundreds of thousands of dollars have been squandered in railway locations because the engineers, working in unknown territory, have adopted the first feasible route, whereas, had they possessed detailed maps of the entire territory, better alignment and better grades might frequently have been secured. So it is with any large drainage project, and years may be spent in developing difficult projects for drainage through routes which appear the only practicable ones available, whereas a complete knowledge presented in bird's-eye view, as on a topographic map showing the relations of the swamp lands to all of the surrounding drainage channels, may frequently develop opportunities previously unsuspected.

A few years ago it was the fashion for orators expounding upon the advantages of irrigation to point to its great antiq-



A Road in the Dismal Swamp, North Carolina, showing the Shallowness of the Water



Cypress Swamps in the Dismal Swamp, North Carolina, showing the Shallowness of the Water

uity, and to show how even in biblical times the valleys of the Euphrates and of the Nile and the Jordan were watered artificially, even before the Hindoos and Mexicans developed their irrigation systems; but we may point to almost equal antiquity for drainage. Biblical references to this may be lacking only because the people of biblical times lived in arid regions, but in Greece, at an early period, record is left of the reclamation of swamp lands by drainage. The earliest drainage project of any magnitude is that for the reclamation of Lake Copias, a great marshy tract in the neighborhood of Thebes, Greece, 60,000 acres in extent. In modern times this project has been elaborated, and twenty miles of main canal, a wide dike, and 2,000 feet of tunnel have been constructed. This work is of special interest to us because at the outfall of the drainage channel is a drop of 170 feet which will yield about 1,000 horse-power, and, still more interesting, this water will then be available for irrigation of the arid land near the city of Anthedon.

THE DRAINAGE OF THE VALLEY OF MEXICO

On our own continent the project for the drainage of the valley of Mexico dates back to the fourteenth century, when the Aztec kings built their city on an island among the lakes and protected it by dikes of great magnitude. They divided the area which they drained into five districts, in such manner that the swamps have been segregated about five lakes. It was they who started the celebrated Nochistongo cut for the discharge of the river Catutlitan. In the seventeenth century this project was replaced by one for tunneling, when a force of 15,000 Indians completed a tunnel ten miles in length in the almost incredible time of eleven months.—Owing to faulty construction, this tunnel caved, and it was over one hundred years afterward before the present drainage projects, which include the whole valley of Mexico, were undertaken. These drainage works had cost the Mexican treasury $3,000,000 by the middle of the seventeenth century; over $8,000,000 by 1830; and now, as they are nearly completed, a total of $20,000,000 has been expended on them. The results have, however, been fully commensurate to the outlay. A vast area has been drained, freed from malarial diseases, and made not only habitable, but productive in the highest degree. The main canal controls the entire drainage system of the valley; is thirty miles in length, with an extreme depth of 60 feet and a bottom width of 17 feet. These works, which include a great tunnel 12 feet in diameter, rank with the greatest achievements of modern times.

BEGINNING IN THIS COUNTRY

In our own country many drainage works of minor importance have been undertaken by individuals, corporations, districts and states. In Louisiana much important work has been done in the neighborhood of New Orleans; in Florida near the Everglades; in Minnesota and North Dakota on the upper Red River valley; in Indiana, in the Kankakee marshes, and in California in the lower Sacramento Valley. The existing works in our own country, however, bear about the same relation to those still untouched as did the earlier irrigation works of the West to the vast undertakings now under construction by the Reclamation Service. All projects which were most evident and which on examination presented the best prospects of financial success have been constructed. The people of Illinois, of lower Minnesota and other portions of this vast country have built ditches and drained the lands in which they now live; but the more extensive and more expensive drainage projects await that touch of the wizard's wand which, held by the federal government, alone may derive sufficient benefit in the creation of new homes and new productive areas to warrant the vast expenditure and the tardy return which their reclamation promises.

As with irrigation, this problem was first turned over for solution to the states, to which the government patented over

63,000,000 acres reported by the General Land Office as swamp lands. In so doing the original legislation contemplated the early reclaiming of these lands by the construction of ditches or levees. The states have parted with much of these swamp lands in grants to railroads, to corporations, and to individuals in the expectation that they would drain them. The complications, however, resulting from any attempt on the part of private institutions, or of counties or states, arising from conflicting property rights and conflicting benefits, have proven such that many of the most important projects remain yet unstudied. If an individual build the works, how will he be recompensed for benefits to adjoining works of his neighborhood? If the state build the works, how will it be recompensed for benefits to government lands? If the federal government build the works, it alone may successfully secure the cooperation of individual landholders and of states, and assess benefits proportionately among all. The way has been blazed for us by the Reclamation Act. The procedure in organization of the landholders into associations has been so successfully worked out that the government is actually constructing great irrigation projects at vast expenditure of federal funds when the immediate benefit will accrue almost wholly to private landowners, who shall recompense the government for the outlay.

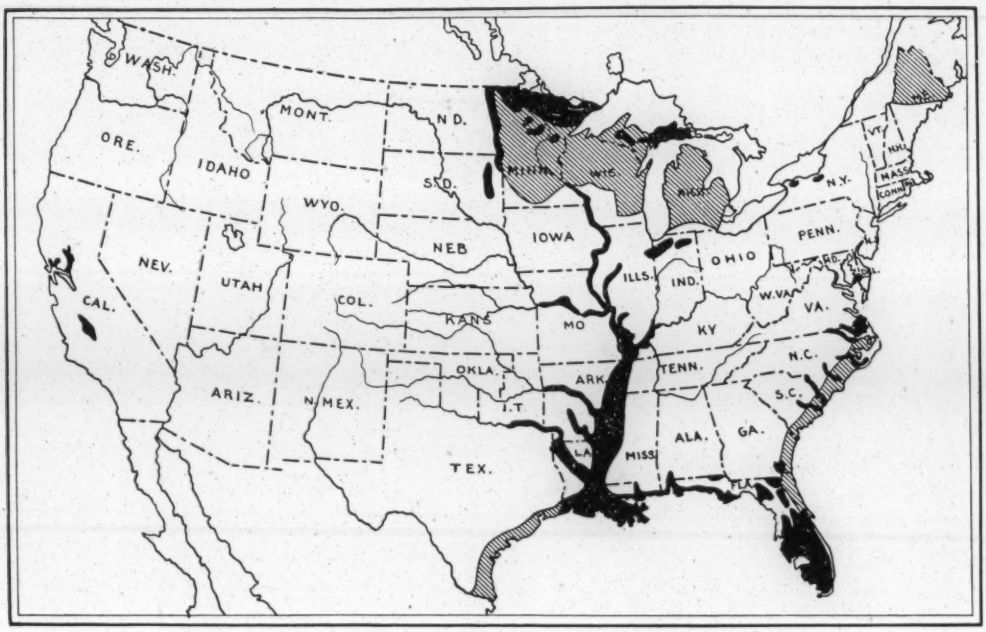
For a number of years several of the states have been actively engaged in efforts to aid their people in the drainage of their swamps. Foremost among these in results accomplished are the states of Minnesota, California, and Florida. In the former is a state drainage commission provided with generous annual appropriations, which are expended through the medium of a drainage engineer in actual construction of ditches. A reconnaissance survey for the study of drainage projects has been made for nearly the whole upper portion of Minnesota, and many miles of more detailed surveys have been made throughout the length of the Red River valley in Minnesota and North Dakota, covering projects for construction of many drainage ditches. Finally, a number of these ditches, some of considerable capacity, have been built and are reclaiming lands through which the farmers have constructed their separate farm drains.

RECLAIMING THE SWAMPS IN SACRAMENTO AND SAN JOAQUIN VALLEYS, CALIFORNIA

In California the state has been engaged for many years in studying projects for and aiding in the reclamation of overflowed and swamp land in the lower Sacramento and San Joaquin valleys. These lands are so low lying that gravity drainage by ditches has been found impracticable and reclamation is by the construction of levees and the pumping of the enclosed area. Some of the protective works in that state are of great extent, covering from seventeen to sixty thousand acres each and involving expenditures ranging from $150,000 to $1,250,000 in various districts. At present there is under consideration a systematic scheme for leveeing, drainage, and pumping, the construction of which will cost many millions of dollars. Individual, county, district, and other independent efforts have resulted in the expenditure of over seventeen million dollars for construction purposes in this area which have been actually wasted, as the work of reclaiming will have to be done over on broader and more comprehensive lines, so that the drainage for these vast areas of submerged land may ultimately involve expenditures exceeding twenty-five millions of dollars.

THE CONDITIONS IN FLORIDA

In Florida the drainage problem has been an acute one for several years past. Realizing how sparsely Florida was settled and how difficult it would be to induce railroads to build through its wildernesses, the United States government in 1856 granted to the state every alternate section in a strip 12 miles wide as an in-



Outline Map showing Swamp Areas in United States

The black indicates swamp areas; ruled portion indicates areas interspersed with swamps

ducement to railroad building. This and an earlier grant of 500,000 acres in 1841 are in no wise connected with the Swamp and Overflow Act of 1850. This latter act, with succeeding acts of like kind, ceded to the state of Florida and to other states the bulk of the swamp lands with a view to the states constructing the necessary levees and drains to reclaim the swamp and overflowed lands within their borders. Among other things, the act provided that the fee-simple title to said lands should vest in the said states "subject to the disposal of the legislatures thereof; provided, however, that the proceeds of the said lands—whether from sale or by direct appropriation in kind—shall be applied exclusively, as far as necessary, to the purpose of reclaiming the said lands," etc. Under this act Florida received about 20,000,000 acres of land, "the proceeds of which," the act itself says, "shall be used exclusively for their own drainage."

But the legislatures of the early eighties were railroad legislatures—they believed in building railroads and opening up the state to immigration; and any company which would agree to build a good road could secure a land grant of from 5,000 to 20,000 acres for every mile built, and if the state owned no land contiguous to the line building, it would be given land perhaps several hundred miles distant.

Governor Jennings, in 1901, took the position that the United States government has granted these lands to the state for their reclamation and drainage, and that the law had not intended that these lands should be given railroads which had not built perhaps within two hundred miles of them. His successor, Governor Broward, introduced a bill, which was passed with only four votes recorded against it in both houses, and in order to make the act secure a joint resolution for an amendment to the constitution of the state embodying this act was also passed.

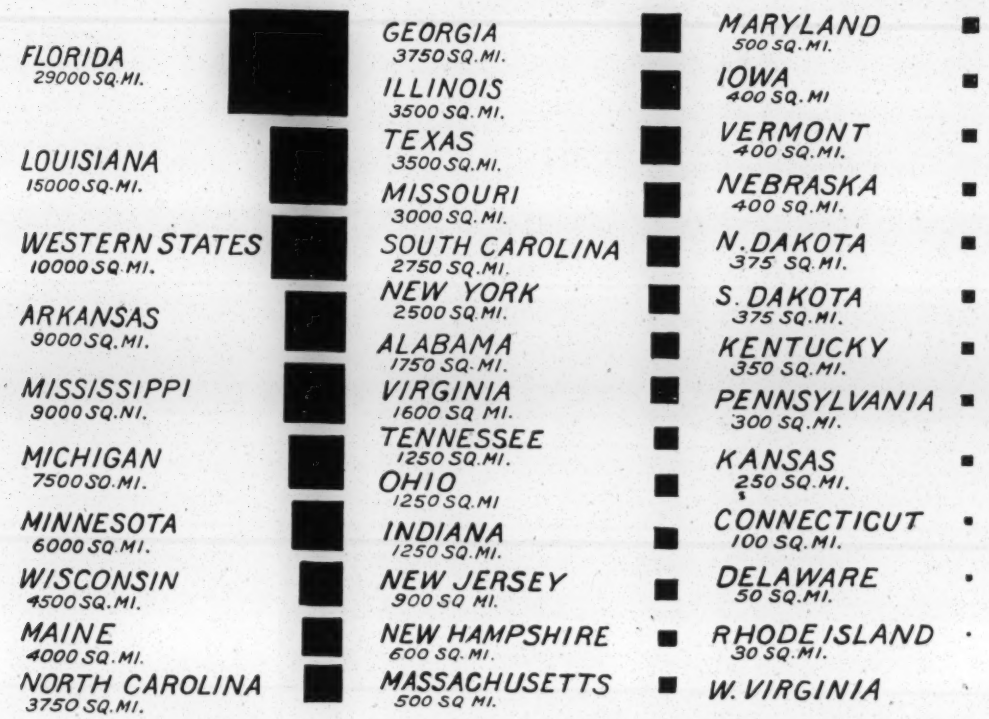


Diagram Illustrating the Swamp Areas of the Different States

This act provides for "drainage districts," in which they may levy a tax, not to exceed ten cents per acre per annum, on all swamp or overflowed land in that district, and to expend the money so collected in the drainage of these lands.

Progressing now, as with irrigation, from state to federal action, the United States government has recently shown a disposition to aid in the reclaiming of swamp lands by drainage. The period of unaided private endeavor is long past; the effort at state reclamation through drainage districts is showing its inability to cope with the problems involved. None can doubt that ultimately the federal government must take up the problem and treat it in the broad and comprehensive manner essential to its proper solution. A few years ago the Division of Irrigation Investigations of the Bureau of Experiment Stations of the Department of Agriculture had its title changed to that of Irrigation and Drainage Investigations, with an increased appropriation, the purpose of which was to cover drainage inquiries. For several years past this division has examined into and prepared plans for the drainage of individual farms as examples for the neighborhood, and also of large areas of swamp or overflowed land, of which it has made surveys through the various agricultural experiment stations, sometimes in cooperation with the states. An instance of the latter work has been a complete preliminary survey of the western side of the Red River valley in North Dakota. From this, preliminary plans and estimates have been prepared having in view the complete reclamation of the swamps involved. Similar investigations have been made by this division on the Missouri River near Yankton, South Dakota, the Wabash River in Indiana, the Illinois River in Illinois, in the Florida

Everglades, and elsewhere. The above work has had in view only the furnishing of assistance to individuals or to communities and does not contemplate federal construction, nor have permanent marks been left on the ground by the surveys.

Recently, at a first national drainage congress, held in Oklahoma, a national drainage association was organized, the purpose of which, through annual meetings and other organized effort, is to advance the cause of federal reclamation by drainage. The congress authorized the appointment of a vice-president from each state, in addition to the president, secretary, and other executive officers. Resolutions were passed recommending that the federal Congress enact legislation which would provide for survey and actual construction by the federal government of drainage reclamation works. During the last two sessions of Congress several bills have been introduced having this end in view. Some of these are of local application; one provides for the drainage of the Dismal Swamp of Virginia; another provides for the drainage of the swamp lands of Minnesota, but by far the more important are several bills "for the establishment of a drainage fund and the construction of works for the reclamation of swamp and overflowed lands" in all the states. These bills are drawn on lines following closely the Irrigation Reclamation Act of 1902. They provide for the creation of a special drainage fund in the Treasury Department, to be derived from moneys received from the sale and disposal of public lands in the states east of the arid region; also for a working fund of about $2,000,000, to be loaned by the federal government until such time as the sale of reclaimed lands may permit of its return to the Treasury. The drainage fund is made a revolving fund by arranging that the cost of construction of drainage work shall be assessed against the land sold and the proceeds returned to the fund. It is finally provided that the execution of the act shall be vested in the Secretary of the Interior, presumably in the existing Reclamation Service, which has already proved its efficiency.

PRELIMINARY PLANS

A special act passed by Congress in its session of 1905-'6 appropriated $15,000 for a survey and report with a view to construction of drainage works for the reclamation of the swamp lands in the ceded Chippewa Indian reservations in Minnesota. Under this act surveys were made in the fall of 1906 by the Geological Survey covering over 400,000 acres of these lands. The segregation and withdrawal from sale and occupation of unsold government lands in this area reserves the remaining public lands as a source of revenue from which to refund the cost of construction. The report of the results of this survey shows that the necessary works involve the drainage of nearly 267,000 acres of land and the improvement of 135,000 additional acres. In the short period of three months sufficient instrumental data was secured to make it evident that here was an admirable and typical drainage project showing what may be done under federal direction. Main lines of canal, with subsidiary and minor drainage ditches to reach every 160 acres were designed, and the estimated cost of construction of these works is about $1,080,000. Dividing the reclaimed lands into groups according as they will be wholly reclaimed or only improved, it is found that an average assessment of from $1.62 to $3.23 per acre will cover the cost of construction. This is a region in which drained lands are at a premium at prices ranging from $12 to $15 per acre; so that it is evident that if these lands were drained the proceeds of their sale would readily return to the government the entire cost of construction, even if sold at a figure less than one-half that of current market values.

THE FLORIDA EVERGLADES

The reclamation of the Florida Everglades is more than a promoter's dream;

some important drainage work has been done already through grants from the state, especially to the Disston Company, on the Kissimmee lands, whose Saint Cloud plantation yielded over 6,000 pounds of dry sugar to the acre for an entire month's run. These lands are in the upper portion of the celebrated Everglades which surround Lake Okeechobee, in the central part of the state, and from there stretch due south one hundred miles to Cape Sable, varying from twenty to forty miles in width and covering an area of 3,700,000 acres.

There are stretches of prairie land in this, and there is considerable cypress timber, but the most of it is a saw-grass marsh with a soil from three to fifteen feet in depth, covered with a few inches of water the greater part of the year. During an exceedingly dry season water can only be found in the sloughs or runs, which extend in every direction. During and after the rainy season, which usually extends from June to September, when the Kissimmee Valley has poured all of its rainfall into Lake Okeechobee and filled up the "glades," it is quite easy to get about through the tortuous channels—provided you use a small skiff.

Along the eastern edge of the Everglades there is a ledge of rotton limestone, slightly higher than the surface of the glades, which in a measure holds back the water from overflowing the adjacent lowlands. In order to drain the Everglades it would be necessary to widen and deepen the rivers where they have cut through the rock reef, and then extend them by a system of canals until Lake Okeechobee was reached. After cutting through this rock reef nearly all the excavation necessary would be through sand and muck.

THE DISMAL SWAMP

The celebrated Dismal Swamp of Virginia is one of the well-known swamp areas awaiting reclamation. This is an ordinarily elevated, nearly level land, with such imperfect drainage that it remains constantly inundated to a slight depth. The swamp is practically on a hillside, sloping gradually upward from an altitude of twelve to twenty-two feet above mean tide at its summit, near the center of which is Lake Drummond—a shallow, circular body of water about 2¾ miles in diameter and only five to six feet in depth. The lake is surrounded by woods, and at some points cypress trees grow into the water, the depth of which decreases rapidly through the swamp, where it is rarely greater than 1½ feet, and is usually but a few inches. Some of the marginal portions of the swamp have been drained and furnish excellent farming land. The original swamp at one time included the Green Sea, but the Dismal Swamp Canal has in measure drained the intervening region, in which work the branch Herring Canal has aided. This indicates what may possibly be accomplished by the further construction of drainage ditches.

Another of the great swamps of the United States is the Kankakee Marshes, which cover about one-half million acres distributed over seven counties in northern Indiana. The swampy condition of Kankakee Valley is due to a slight fall in the valley and the extremely crooked and tortuous channel of the river. Between its source and the Illinois State line the direct distance is 75 miles, whereas the stream flows a distance of 240 miles, in the course of which it makes at least two thousand bends. The difference in elevation between these two points is but 97 feet, or a fall of 1.2 feet per mile. It is not improbable that a complete topographic and drainage map covering the entire area, not only of the Kankakee Valley, but the neighboring uplands and drainage basins of the Wabash and the northern tributaries of Tippecanoe River, will develop drainage possibilities superior to those found within the Kankakee Valley alone.

THE REVOLUTION IN RUSSIA*

By William Eleroy Curtis

IN order to understand the significance of events in the revolution that is now going on in Russia, it is necessary to recall what you learned in your school days, that it has the largest area of any nation and a population of one hundred and forty million souls, including eighty million peasants. The illiterate classes constitute at least three-fourths of the population—one hundred and twelve millions who cannot read or write. During the last few years there has been a very rapid improvement in this respect by reason of the establishment of village schools, but a wise man once said that "a little learning is a dangerous thing," and his wisdom has been demonstrated in Russia.

The introduction of a school system accounts for the remarkable spread of socialistic ideas among the working classes of that Empire. Kipling once said that as long as a Russian muzhik wore his shirt outside his trousers he was a safe citizen; when he tucked it in, he became dangerous to the state. The truth of that quaint remark has been forcibly demonstrated within the last eighteen months. The Russian workmen, in the cities and factory towns and the peasants in the fields, who constitute four-fifths of the vast population, have vague and fantastic ideas of government and of the meaning of the word "liberty." They will follow anybody who promises to improve their condition, and are merciless and vindictive toward every one they distrust. For that reason they are more dangerous and destructive than the corresponding class in France.

THE PEASANT'S NEED OF LAND

The peasants were formerly serfs, and were emancipated by the grandfather of the present Czar, who is known as Alexander the Good. When they were given their freedom the government applied the socialistic principle that the soil belongs to the men who till it, and each family was given an average of six and a quarter acres of cultivated land, which was then sufficient to supply their wants. The increase of population has cut down this average to three and a half acres, which is not sufficient to support a family. According to experts, at least seven acres is necessary to sustain an average family; so that the peasant has only about half the land he needs. The remainder of the Empire is held in vast estates belonging to the government, the crown, the monasteries, the grand dukes, the nobility, and the boyars or gentry, and only part of it is under cultivation. The peasants need the idle land and they demand it. They have emphasized their demands with the torch and the bludgeon, and during the last eighteen months have destroyed several hundred million dollars' worth of property, including some of the finest estates in the Empire, under the leadership of demagogues, who have aroused their passions and have made them insane with drink. In his natural state the Russian peasant is honest, stupid, superstitious, and stubborn; when he is excited he becomes a savage. He has no ideals; he has no comprehension of politics; he does not comprehend the word "constitution," but he knows that he needs more land. There is not enough vodka in all the Empire to quench his thirst, and his vision is limited to his own local interests.

The greater part of the peasants' land is held in common and the fields are alloted by the village elders, who are elected by the heads of families and exercise a tyrannical authority over the communities. No peasant can sell his land or borrow money upon it; he cannot leave his native place without the consent of the elders. His condition of serfdom has been

*An address to the National Geographic Society, December 14, 1906.

continuous; only his master has been changed.

The provincial government is administered by "zemstovs," which enact and enforce laws for local purposes, assess and collect taxes, provide schools, build roads, look after the poor and the afflicted, and, under the censorship of a governor-general appointed by the Throne, perform the functions of our state officials.

THE CHAOTIC IMPERIAL GOVERNMENT

The imperial government is administered by the Czar with the assistance of a council of state corresponding to our Cabinet, and a Senate, which corresponds to our Supreme Court, with some additional jurisdiction. The Czar issues edicts which have the force of law, upon the recommendation of his ministers; the Senate formulates the imperial will into statutes and promulgates them. The Czar seldom sees his advisers together, but confers with them separately; so that there is no unity, no coöperation, no team-work, and continual friction, intrigue, misrepresentation, and misunderstanding.

The Prime Minister is nominally at the head of the government and is supposed to frame and direct its policy, leaving the details to his associates and subordinates, but in the past they have often tried to undermine and betray him and counteract his influence with the sovereign. Thus there is always a struggle going on around the Throne between conflicting interests in the cabinet, the members of the imperial household, and the Czar's own family, his mother and his wife taking an active part. His Majesty is pulled and hauled this way and that by the various factions that are able to reach him, and the person who has exercised the most powerful influence over him is his former tutor and the tutor of his father, an aged lawyer named Pobiedonostseff, for many years the actual head of the Russian church. He is the most reactionary man in Russia, a type of the fifteenth century statesman, the most conservative of conservatives, who resists all innovation as contrary to the well-being of man. He is convinced that the best form of government is an absolute despotism, and continually admonishes the Czar that he has no right to share the government with the representatives of the people, because God has conferred the duties and responsibilities of an autocrat upon him and he must retain them or offend God.

NICHOLAS II KIND AND VACILLATING

The Czarina was formerly very liberal, but since the birth of her boy, two years ago, her opinions have been reversed, and she is now quite as determined as the Czar's old tutor in support of the autocracy, because she desires to hand down to her son all the prerogatives and power his ancestors have exercised.

Nicholas II has a gentle disposition, a kind heart, and a desire to promote the welfare of his subjects. We have been told that a certain place is paved with tions and believes that progress is congood intentions; and he has an abundance of that material, but has no fixed purpose. He is a timid opportunist and usually acts too late. He vacillates as different people talk to him, and the last person he sees usually controls his actions. Instead of strengthening himself by attracting the support of the liberal elements, he has continually discredited his own sincerity and has placed himself in antagonism to the interests he promises to serve. He excites the distrust of his ministers and his supporters, instead of winning their confidence. Every concession he has made has been wrung from him by fear. He formally declared it to be his "inflexible will" that Russia should have a constitution and a parliament, but as soon as the words were uttered he began to devise means to prevent himself from carrying out his own promises or limiting their fulfillment as much as possible. Concessions that would have been received with universal gratitude at the beginning of the present year would now be rejected with contempt.

Naturally he is inclined to be liberal and tolerant. At the same time he is de-

votedly attached to the traditions of the autocracy, and has a profound sense of his obligations to the memory of his father and to the founders of the Romanoff dynasty, which makes him hesitate about departing from the policies they pursued. He has a deep vein of religious sentiment and is intensely superstitious. He believes in miracles and omens; he wears amulets. In order to secure an heir to the throne, he made a pilgrimage incognito to the shrine of Saint Seraphim, where women who have no children are accustomed to go. He surrounds himself with clairvoyants and often communicates with the spirit of his father through spiritualistic mediums. Charlatans impose upon his credulity and occupy time which should be given to matters of state. His ministers complain that he insists upon discussing trifles when momentous problems require his attention. He is devoted to his family; he is the first Czar that any one can remember who lived a moral life and his ministers complain that he is playing with his children when he should be in the council chamber.

He is a voluntary prisoner, guarded by an army of 6,000 men, and no one can see him except in the presence of his guards. He knows only as much about events and affairs as his attendants think expedient. They prepare a summary of the contents of the newspapers for him every morning and naturally do not include anything that might interfere with their own plans or weaken their own influence. He does not comprehend the situation in Russia. He has been the continual victim of misrepresentation and bad advice. If he would break away from the influences that surround him; if he would talk with well-informed and disinterested men, he might adopt a different policy.

THE OFFICIALS ARE NOT RESPONSIBLE TO THE PEOPLE OR THE COURTS

The fundamental error in the Russian system of government is that the officials are in no way responsible to the people or the courts. If an official offends his neighbor, if he commits a crime, if he robs the treasury or murders an innocent citizen, he is tried by his superior officers in secret and not by a court. The prosecuting witness is not permitted to confront him or to be represented by counsel, and neither he nor the public are permitted to know what has occurred at the trial or what punishment has been imposed. That is the reason why no one is punished for the Jewish massacres. Everybody knows that they were planned and carried out by the police in retaliation for the activity of the Jewish revolutionists. This has been admitted over and over again, but no one has ever been punished. Members of the recent ministry were guilty of revolting cruelties and acts of barbarism, but they were allowed to go without even a reprimand. When I asked why this was permitted, a prominent minister replied that it was impossible to fix the responsibility under the present system of government.

At present any official knows that he will be protected in anything he does, provided his act does not offend the men above him, and can defy the public and the courts. Mr Herzenstein, one of the ablest men in the Empire, the highest authority on financial and economic questions, and of unimpeachable integrity and patriotism, was assassinated last August by a policeman under the orders of his superior officer. It was a deliberate murder, and one of the government organs at Moscow published the news twelve hours before the deed was committed. The assassin's name was Nishikin; he was absolutely identified, but he was never punished, because he was responsible to no court and to no authority except the men who directed him to commit the crime.

It is easily understood why such a condition has not been corrected. The entire bureaucracy of the Empire has been united in defense of their most important prerogative. But until the officials are made responsible to the courts like ordinary citizens, there can be no genuine reform in the Russian civil service.

In the third section of a famous manifesto of October, 1905, the Czar promised

"to make all classes equal before the law and assure the independence of the courts." In the first paragraph he says: "It is the first duty of all authorities in all places to fix the legal responsibility for every arbitrary act, in order that sufferers through such acts shall have legal redress."

To this the douma responded: "The whole Russian people welcomed this message with an impassioned cry, but the very first days of liberty were darkened by heavy afflictions laid upon the land by those who still bar the way of the people to the Czar and trample under foot all the principles of the manifesto; by those who cover the land with sufferings and executions without judicial sentence; with atrocities, fusillades, and with imprisonment."

As I have said already, the spread of socialism among the peasants during the last few years has been going on with amazing rapidity as they learn to read and write and tuck their shirts into their trousers, while a passive revolution under unconscious leaders has transformed almost the entire population of the Russian Empire from submissive subjects to discontented critics of the ministry and the court.

Dissatisfaction with the autocracy has penetrated every stratum of society in every part of the Empire, because of the appalling corruption of the court and the government, the tyranny of the police, the scandalous behavior of the grand dukes, and the general recognition that an autocracy is not consistent with modern civilization. When the armies of Russia were defeated in Manchuria and its navy was destroyed, this universal dissatisfaction was manifested in various forms. The labor unions furnished the motive power, as you might say, and gave an impetus to an irresistible movement, while the "Intellectuals" and the "Intelligencia," as the educated classes are called, followed their lead.

The great strike which stopped every wheel and paralyzed every industry in the entire Empire convinced the Czar that he must do something to satisfy public clamor, and he promised his people a constitution and a parliament. Twenty-three years before his grandfather prepared a plan of limited representation in the government for the people. It was lying on his desk awaiting his signature when he was assassinated, and the clock was turned back twenty-five years. When the time came when something must be done to save the dynasty, in a rescript dated March 3, 1905, Nicholas II said:

> "I am resolved henceforth, with the help of God, to convene the worthiest men possessing the confidence of the people, and elected by them to take part in the elaboration and consideration of legislative measures, and with the examination of a state budget."

THE MEMBERS OF THE FIRST DOUMA

A commission under the Minister of the Interior prepared a plan, an awkward and complicated system, which was almost equivalent to universal suffrage; an election was held in March, 1906, and a fairly representative parliament was chosen. There was an upper house composed of ninety-eight members, one-half of whom were appointed by the Czar and the other half chosen by the commercial, industrial, and professional organizations, the faculties of the universities, and the church. The lower house, called the douma, consisted of 440 members, of whom, according to a canvass, 276 were in favor of a reorganization of the government from an autocracy into a limited monarchy, and 164 were in favor of a republic, to be secured by armed revolution if necessary. There was not one supporter of the autocracy in the entire body, and only five of the members refused to vote for the radical and impossible program adopted as a reply to the first speech from the Throne. Those five conservatives did not vote against the address, but left the chamber in order that it might be adopted unanimously.

Twenty-three races were represented in the douma, as follows:

Russians	265
Little Russians	62
Poles	51

Jews	13
White Russians	12
Cossacks	12
Lithuanians	10
Tartars	8
Letts	6
Georgians	5
Germans	4
Vashkirs	4
Armenians	4
Buriats	2
Mordvanians	2
Votiaks	2
Kirghis	1
Circassians	1
Bulgarians	1
Roumanians	1
Kalmuks	1
Chuvas	1
Ossetines	1

Almost every occupation was represented, as follows:

Peasant farmers	56
Boyars, or large land-owners	46
Lawyers	39
College professors	37
Clergymen	27
Managers of large estates	26
Merchants	24
Government officials	24
Capitalists	22
Village officials	21
Factory workmen	17
Physicians	16
Commission men	15
School teachers	14
Army officers	13
Engineers	11
Newspaper men	11
Contractors	9
Bankers	7
Railway men	4
Scientists	3

Every religion in Russia had its representatives upon the floor, as follows:

Orthodox Greeks	322
Roman Catholics	30
Old Believers	20
Jews	12
Mohammedans	12
Protestants	11
Armenians	9
Buddhists	2

One of the most striking figures in the entire assembly was a Roman Catholic archbishop, Monsignor Roop, of Wilna, whose serene face, stately presence, and purple robes made him conspicuous. Seven Mohammedan mullahs, sent up by the Tartars of the Caspian provinces, appeared in their conventional robes and turbans and sat beside several priests of the Orthodox Greek Church wearing long hair and beards and the peculiar hat and veil of their profession. It was therefore a most interesting assembly. It probably contained a greater variety of elements, conflicting and rival, than any other legislative body that ever met—all grades of society, education, and intelligence. Princes sat beside peasants, and mingling with the thirty-seven college professors were six shaggy muzhiks who could not read nor write. The ablest theorists of the Empire and some of the most profound scholars of Europe were sent by the different universities, and the man who controlled the action of the douma, as completely as Speaker Cannon controls the present House of Representatives in Washington, was a member of the faculty of the university of Chicago, Professor Milukoff, a charming gentleman of great learning, of lofty ideals and unlimited benevolence, but entirely without experience in politics or legislative affairs, or practical knowledge of administration.

There were twenty-seven different political organizations, representing every phase of opinion from the ultra-conservative to the red radical; socialists, trades unionists, and other men of fixed purposes and extreme views. The most noisy and conspicuous were professional agitators, socialists and labor reformers, most of whom, although they call themselves "the party of toil," had never earned a dollar by manual labor in their lives. They professed to represent the views of honest farmers and mechanics and had been elected by them, but accomplished nothing and only injured the interests of their constituents.

THE POLITICAL PARTIES

The members of the douma might be divided into three groups, as follows:

Conservatives	60
Moderates	250
Radicals	150

The principal parties were, first, the Octoberists, so called because they were elected upon pledges to support the manifesto issued by Nicholas II in October, 1905, in which he promised his people a constitution, a parliament, free religion, free speech, and all that is meant by civil and political liberty. This party was composed chiefly of business and professional men from the great cities, land-owners, and men of large affairs. Their numbers were limited, and they came nearer than any other class to support the government. Stolypin, the present Prime Minister, was one of the leaders of the Octoberist party. His brother is still the secretary of its executive committee and one of the editors of its newspaper organ. Generally speaking, the Octoberists advocated a limited monarchy similar to Germany, and a broad, liberal system of education. They demanded a reorganization of the entire government, the reform of the judiciary, and almost universal suffrage.

The Constitutional Democrats in their platform demanded all this and more, including a ministry responsible to the parliament rather than to the Czar. They would be satisfied with a government like that of Great Britain.

The Constitutional Democrats controlled the douma because they had a majority of its members, and if they had adopted a rational and practical program and carried it through, they would have accomplished great things for Russia; but, from the beginning, they committed blunder after blunder and threw away every one of the many golden opportunities that were offered them. They should have shown some gratitude to the Czar for the constitution he had given them and for other concessions he had made, and encouraged him to make more; but, instead of adopting a conciliatory policy, they bullied his ministers and accused him of insincerity. In order to avoid controversies among themselves they made concessions to the socialists and revolutionists and allowed the most radical members of those parties to control the proceedings of the douma. Their generosity was suicidal. They seemed to think that they must present a solid front to the autocracy. They sacrificed everything for the sake of unanimity and loaded down their program with wild and impracticable propositions. It was a pitiful display of incapacity. When the leaders were criticised for yielding to the radicals, they would explain that the fundamental principles of their doctrine was freedom of thought and freedom of speech, and what right had they to object to the opinions of a fellow-being? No such Utopian policy was ever known in a legislative body before. No such generosity was ever extended before by one political party to another, and it not only impaired the usefulness of the "Cadets," as the Constitutional Democrats were called, for short, but proved their destruction.

The Social Democrats were next in numbers, and their platform was purely socialistic, based upon the theory that differences in wealth and station are wrong, and that all authority and all law are violations of the rights of man. They want a republic in Russia. So do the Social Revolutionists, who would accomplish the same thing by violence and are responsible for the bomb-throwing, the assassinations, the mutinies, the destruction of property valued at hundreds of millions of dollars, and other crimes against individuals and society in carrying on their propaganda. The members of this party defy all law; they trample upon all rights. They are vindictive, cruel, and merciless. They are anarchists, nihilists, and terrorists, but are always willing to die with their victims. The nerve and stolidity of the Russian revolutionists were never surpassed by any human beings. They do not seem to have the slightest fear of death and are utterly indifferent to danger. Their boldness is amazing. Very few bomb-throwers have escaped alive, and no member of the fighting group of the Social Revolutionist party has broken down or even faltered in the presence of the hangman.

UNPROFITABLE DISCUSSIONS AND IMPOSSIBLE DEMANDS

Considering the material of which it was composed, the douma displayed a remarkable amount of patience and self-control, although its time was wasted in unprofitable discussions and its demands upon its sovereign were unreasonable and impossible to grant. But that was perfectly natural. A dozen or more of the leaders had suffered banishment to Siberia; as many more had been imprisoned in dungeons for conscience's sake; two-thirds of the entire body had suffered injury or humiliation in one form or another from the government because of their political views. One of the peasant members had been beaten almost to death, as his maimed and crippled body bore witness, because he had been brave enough to present the complaints of his village to the governor of his province.

The douma was in session 119 days and it passed two bills, both of them of the greatest significance. One abolished the death penalty, and every member on the floor felt a vivid personal interest in that legislation; the other provided for the appointment of a commission to supervise the expenditure of the famine relief fund, which was a fortunate thing, because the Assistant Secretary of the Interior, one of the worst men in Russia, is now under investigation for pilfering from that fund.

Until the douma met, the people of Russia had never been allowed to express their opinions, and the repression of a thousand years was relieved at its sessions. Speech is a safety-valve for an overcharged mind, elsewhere as in Russia, and the outbreaks of enthusiasm and indignation were no more boisterous than I have seen in our own Hall of Representatives, and, compared with other legislative assemblies of Europe, the proceedings of the douma were orderly and decorous. But, unfortunately, instead of protecting its own rights and insuring its own existence; instead of passing laws to gratify the land-hungry peasants; to provide election machinery; to make government officials responsible to the courts; to reorganize the judiciary and the police; to establish a system of education and other important measures, the time was wasted in abusing and baiting the ministers and in high flights of oratory. The Extremists ruled because they were the most aggressive; the Conservatives submitted in order to promote harmony and present an unbroken front of opposition to the autocracy. Finally a minority, under the lead of the Radicals, overstepped the bounds of decency and passed a resolution false in statement, wrong in spirit, intemperate in terms, warning the people that they could not trust the Czar or his officials. Only about one-third of the members voted for it, the Radicals and the Revolutionists; but the Conservatives and moderate members would not vote against it, because they were afraid of the Extremists. They retired from the chamber; but the effect was the same, and the Czar exercised his right to dissolve a mutinous and disloyal parliament, just as the German Emperor, for even less reason, dissolved the Reichstag December 12.

NICHOLAS' LOST OPPORTUNITY

But there had been no sympathy between the two powers from the first, and if the douma was guilty of many blunders, he was guilty of more. His list of lost opportunities is longer than that of any ruler in modern times. If he had received the members of the douma with kind words and a conciliatory disposition, he might have won over a large number of them to the support of his own policy or program without relinquishing a particle of his dignity or authority; but on the day it met he practically repudiated the body he had himself created. Hence the Czar had no friends or supporters in the lower house, and the upper house, composed one-half of men of his own choice, was also against him.

Unfortunately for himself and for his country, Nicholas II is always wavering between right and wrong. If he goes wrong, he acts promptly; if he does right, he delays his action so long that he loses

all the credit he deserves. On the 3d of March, 1905, he promised his people a constitution, but it was not until the 10th of May, 1906, that the promise was fulfilled. In the meantime revolutionary horrors increased, deputations came to beseech him to carry his purpose into effect; but he would do nothing until the creditors of the Empire compelled him to act, in order that he might obtain a loan of four hundred million dollars to settle the accounts of the war and bring the army back from Manchuria. The creditors of the Empire compelled him to keep his pledge and refused to advance another dollar until a parliament had been elected and the draft of a constitution or fundamental law was submitted for their approval.

It was not a liberal constitution, but was more than might have been expected. It was a long step in advance, and it gives as much self-government as the people of Russia are capable of exercising; perhaps more. They have had no experience; the masses are densely ignorant; only one out of four can read and write; 70 per cent of the population do not have the slightest comprehension of what self-government means. The Emperor of Japan voluntarily relinquished the autocratic power that had been exercised by his ancestors for more than 2,500 years; the Empress of China has recently taken the first step toward a similar concession; the Shah of Persia has conceded a parliament which will share with him the responsibility of government, and, as long as Nicholas II was compelled to give his people a constitution in order to save his throne, one might suppose that he would have made a virtue of necessity and gained as much credit as possible for the act; but he lost all that he might have gained, and what is even worse and more lamentable, he has destroyed the faith of the people in his sincerity and has forfeited their respect by permitting the letter and the spirit of his constitution to be violated by his own officials almost every day since it was proclaimed.

The Czar has many good impulses; he has frequent lucid intervals; sometimes he shows a wise and generous spirit. Three times during the douma he offered the Liberals an opportunity to form a ministry, and if the leaders of the Constitutional Democratic party had possessed a particle of common sense, they would have met him half way and accepted his olive branches. The first time he offered them the administration of the government they rejected his overtures in the most contemptuous manner they could devise. The second time they gave the matter serious reflection and discussed it for several days. Finally they agreed to accept, but adopted a program so preposterous and absurd that their reply was not worthy of attention. They would not be content with gradual reform; they insisted that everything should be done in an instant. They were so foolish as to attempt to transform an absolute despotism into a liberal monarchy by the stroke of a pen.

James Russell Lowell, writing of Spain, said:

> "Institutions grow and cannot be made to order; they grow out of an actual past and are not to be conspired out of a conjectural future. Human nature is stronger than any invention of man. When party leaders learn that an ounce of patience is worth a pound of passion. Spain may at length count on that duration of tranquillity, the want of which has been the chief obstacle to her material development."

Elihu Root, in his address to the third Conference of American Republics, at Rio de Janeiro, July 31, 1906, said:

> "Not in one generation, nor in one century can the effective control of a superior sovereign, so long deemed necessary to government, be rejected, and effective self-control by the governed be perfected in its place. The first-fruits of democracy are many of them crude and unlovely; its mistakes are many; its partial failures many, its sins not few. Capacity for self-government does not come to man by nature. It is an art to be learned, and it is also an expression of character to be developed among all the thousands of men who exercise popular sovereignty."

If the leaders of the first Russian parliament could have realized the profound

truth of those axioms, and had they been willing to allow a gradual development of democratic ideas and liberal forms of administration, they might have had the opportunity to guide and control the regeneration of Russia; but they would not listen to reason; they demanded all or nothing. When I asked Professor Milukoff, their leader, why they did not accept what they could get and wait in patience for more, he replied:

"Would you have insulted your revolutionary fathers with such a cowardly suggestion?"

A CARNIVAL OF CRIME AND ASSASSINATION

For several weeks after the dissolution of the douma last August, Russia saw a carnival of crime, assassination, and violence such as never occurred before, even in the bloody history of that empire. The week I spent in Warsaw twenty-two policemen were killed on their beats, and not one of the assassins was detected. There were mutinies in the army and the navy. You will remember how the fortresses at Cronstadt and Helsingfors were seized and the terrible slaughter that attended those incidents. One of the Petersburg papers, edited by Professor Kovaleski, enumerated the assassinations and gave an amazing estimate of the mortality. It declares that 7,300 persons were killed and more than 9,000 were wounded by bombs in massacres and mutinies. Among the killed were 123 governors, generals, chiefs of police, and other high officials. Thirty thousand revolutionists were arrested and most of them were sent to Siberia, while 221 persons were executed. Twelve railway trains containing government treasure were held up and successfully robbed, 400 government liquor stores were robbed and destroyed, and $630,000 of government money was stolen by burglars and highwaymen. All of this was done by the revolutionists.

According to the authority of the "Retch" newspaper, the organ of the Constitutional Democratic party, one member of the late douma has been assassinated, one has become insane, two of the peasant members (Mr Stevanduk and Mr Grevoff) have been beaten nearly to death because they did not accomplish anything for their constituents. Onipko, a most repulsive person and the leader of the terrorists in the douma, has been sent to Siberia. He was captured red-handed, leading the mutiny at Cronstadt. Five members of the douma have been banished; the houses of thirty-three have been searched; twenty-four have been imprisoned for political reasons; 182 have been deprived of civil rights and are under indictment for having conspired to induce the people to disobey the law. These were the members of the douma who signed what is known as the "Protest of Viborg" against the dissolution of the douma and appealing to the people not to pay taxes or to serve in the army. This was a very foolish procedure, because there are no direct imperial taxes in Russia. The revenues of the government come from indirect duties paid upon liquor, from duties on imported goods, from monopolies, and similar sources. The manifesto, therefore, did not injure the general government, but only the local "zemstovs" and "mirs," who collect taxes for schools, roads, and other purposes. The men who signed that protest, 218 in number, might have been held for treason, but the government merely indicted them for conspiracy, and thus made them ineligible for re-election to the douma. About one-half of them belonged to the Constitutional Democratic party and the remainder to the Social Democrats, Social Revolutionists, and other radical organizations. The Constitutional Democratic party, however, is held responsible for the manifesto; its meetings are prohibited notwithstanding the guarantee of free speech in the constitution, and the Emperor's October manifesto. It has been practically dissolved by proclamation, but has nominated candidates against whom the government can find no objection and is carrying on an active campaign.

The more conservative element have organized what they call the "Party of Peaceful Regeneration." It consists of

those who refused to sign the Viborg protest, and their platform condemns their former associates for their uncompromising opposition to the government and their alliance with the revolutionists.

Another new party is called the "Progressive Reformers," but its platform differs little from that of the Octoberists. It advocates a form of government similar to that of Germany, with a ministry responsible to the sovereign, but in harmony with the parliament. Mr Stolypin is a member of the Octoberist party and a sincere believer in parliamentary government, but has never declared himself on the question of ministerial responsibility.

THE GOVERNMENT'S ATTEMPT TO ELECT A SECOND DOUMA WHICH IT COULD CONTROL

The first douma was elected by practically universal suffrage. Almost every man in Russia twenty-four years of age and older was able to participate, which was a mistake, because the illiterate and ignorant millions by the volume of their votes controlled the result. This time Stolypin is determined to get a practical and reasonable douma, and in order to do so is using arbitrary measures. He is fighting fire with fire and force with force. He is disfranchising the revolutionary forces wherever he has an excuse. This is not done directly, but by the Senate, which corresponds to the Supreme Court of the United States and whose duty is to interpret the laws. He has stated frankly that if he does not succeed in getting a douma that will coöperate with him in the reorganization of the government and the reforms he is now carrying out, it will be dissolved and another election will be ordered with still greater restrictions.

Stolypin has instructed all provincial officials to use their best efforts in support of the Octoberist candidates, and in districts where they have no chance, to help the "Peaceful Regenerationists" or other conservatives. The result depends upon the votes of the peasants, who have always been loyal to "The Little Father," as they affectionately call the Czar. At the previous election they were controlled by socialistic agitators, itinerant apostles of anarchy and violence, most of whom were non-residents and were elected to the douma because they promised to accomplish all sorts of impossible reforms. Stolypin is trying to eliminate such leaders from the campaign and to keep professional agitators like Alladin out of parliament. To do this the Senate has construed the election law so that only persons with fixed homes can vote or be voted for, and non-residents are prohibited from taking part in the campaign.

This disfranchises several hundred thousand workmen who participated in the last election because they have migrated from the country to the manufacturing centers. The Senate has also debarred 278,000 employees of the government railways, postal service, and workmen in the government shops, including the most skilled and highest-paid labor in Russia, such as locomotive engineers, stationary engineers, machinists, and draftsmen. The reason, frankly given, is that these classes of workmen are too easily influenced by agitators. It is a wonder that the order was not followed by strikes.

Another edict, issued November 11, forbids officers and soldiers of whatever rank to join political parties, or to attend political meetings or to discuss political questions, and disfranchises every man in the military service.

Civil employees of the government who join or assist either of the revolutionary parties forfeit their positions and all claims to pensions. This includes school-teachers and university professors, nearly all of whom belong to the liberal or revolutionary parties.

The students in the universities are debarred because they are all revolutionists. A recent canvass of the University of Odessa illustrates the political sentiments of the students:

Social Democrats	777
Social Revolutionists	712
Octoberists	317
Constitutional Democrats	167

Labor Reformers	167
Total against government	1,823
Total for government	317

In some of the universities the students are unanimous against the government. Every one of them is a revolutionist, and because they insist upon holding revolutionary meetings, making revolutionary speeches, and singing revolutionary songs in the buildings and on the campus, the government has closed all of the nine universities in Russia and scattered between fifteen and twenty thousand agitators throughout the land, when it might have kept them segregated, where they would do no harm.

Although the October manifesto of the Emperor and the constitution of Russia guarantee free speech, free press, and the right to hold political meetings, the government has suppressed a large number of newspapers and has compelled the publishers of those which are allowed to exist to sign an agreement not to advocate revolutionary doctrines, nor excite the people by attacking the arrangements for the approaching elections, or criticising the acts of the ministry. Mr Stolypin considers it his duty to preserve the peace and suppress opinions and utterances that are likely to cause disturbances. He has announced that the government will not hesitate "to demand that its officials employ all legal measures to prevent the transformation of instruments of progress and peace into instruments of violence and destruction." He has adopted the same restrictive measures toward the reactionaries and is quite as unpopular with them as with the revolutionists. He treats both alike. All extreme opinions or measures are offensive to him. When "The League of Russian Men," an organization supporting the autocracy, asked him for 100,000 roubles to pay the expense of carrying on a propaganda in support of the Czar and the ministry, he refused to give them a kopeck; whereupon they passed a series of resolutions denouncing him as a usurper of authority, as a traitor to his sovereign, and declared that his program of reforms was treasonable and an infraction of the divine right of the autocrat. Apparently the Czar, to whom these resolutions were addressed, has taken no notice of them.

Mr Stolypin justifies his vigorous campaign of restriction, in suppressing revolutionary newspapers and shipping revolutionists to Siberia by regiments, on the ground that all enemies of the state should be prevented from accomplishing their designs by any measures that may prove effective; that the revolutionary organizations, by inciting mutinies in the army and navy and disturbances among the peasants; by robbery, assassination, and other crimes and violence, have placed themselves beyond the protection of the constitution and the October manifesto, and are ordinary criminals; that as long as revolutionary leaders are admitted to the douma they will destroy the usefulness of that body. Therefore it is his duty to keep them out and secure the election of practical, honest, and patriotic men. He contends that there can be no genuine reforms so long as the revolutionary element are allowed a free hand in politics. They are responsible for the industrial and financial depression in the Empire by disturbing public tranquillity. They desire to destroy. They do not want to build up. They are men of no character, no property, no interest at stake; the enemies of society, anarchists, adventurers, fanatics, without the slightest comprehension of the science of government or the meaning of the word "liberty."

THE PUBLICATION OF REVOLUTIONARY BOOKS AND PHOTOGRAPHS NO LONGER INTERFERED WITH

Although public meetings are broken up by the police every day, newspapers are suppressed, and innocent people as well as wicked conspirators are arrested for political reasons, there has been a remarkable change in Russia, and especially in Saint Petersburg, within the last few months. Formerly every printed book and manuscript found in the bag-

gage of a traveler was closely examined and usually seized, in the effort to prevent the dissemination of revolutionary literature. Nowadays manuscripts, books, and pamphlets are passed without question. You can buy revolutionary music, photographs, and post-cards on the streets and at the news-stands. You can find all kinds of newspapers, including the most radical organs of the socialists, upon the files in the reading-rooms of the hotels, and cartoonists are taking amazing liberties with public men and public questions in the comic papers. If such caricatures had been printed two years ago both the artist and the publisher would have gone to a dungeon. Boys on the street are selling photographs of "Martyrs for Liberty"—Polish Jews who have thrown bombs and assassinated officials, revolutionists who have been killed by the police or executed for political offenses, and the leaders of the mutinies at Cronstadt, Helsingfors, and Sevastopol. One of the most popular and profitable photographs represents William Jennings Bryan sitting in the center of a group of the reddest socialists and anarchists in Russia. It was taken on the steps of Tauride Palace during a session of the douma and has done incalculable harm, because it has convinced many honest workingmen that Mr Bryan and the people of the United States sympathize with the bomb-throwers and anarchists.

The mails are no longer interfered with; the censors have been discharged. Foreign newspaper correspondents can criticise the government as much as they like and send their dispatches over the official telegraph lines.

PREMIER STOLYPIN IS ABLE AND BRAVE

Russia has been more tranquil during the last three months than for three years previous. The great strike that was arranged by the socialists as a protest against the dissolution of the douma did not come off, because the workingmen would not obey the instructions of the politicians. The uprising of the peasants which was to occur after the crops had been gathered was indefinitely postponed and few estates have been destroyed recently. No more massacres will be permitted, because Mr Stolypin knows how to prevent them and is determined to do so. There was no unfriendly demonstration toward the government on October 30, the first anniversary of the manifesto which offered liberty to the people and promised many blessings that have not been bestowed. Robberies and murders in Poland have not been so frequent of late. Mr Stolypin has introduced more reforms during the last three months than were ever known in any previous administration. He has taken a sensible view of the situation. He recognizes that the people have been wronged and have grievances that should be redressed. He has tried to see both sides of the situation, and not long ago declared the opinion that "men who are compelled to live on one herring and three potatoes a day cannot be expected to understand the benefits of an autocracy or the obligations of citizenship." He referred to the starving Jews, and while he did not feel at liberty to grant them the full rights enjoyed by other subjects without the concurrence of the douma, he has relieved them from the most severe of the restrictions under which they have been suffering, and now they can go about Russia with an ordinary passport. They may engage in any business, but are not yet allowed to buy land outside the pale of settlement. Jewish children are now admitted to all the schools and universities of Russia without condition. The members of that race are now enjoying nearly all the liberties of those of other races and religions, except that there has been no change in passport regulations, which has been promised from year to year. Foreign Jews are still compelled to explain the object of their visit before they are permitted to pass the boundary. Mr Stolypin will undoubtedly remove that humiliation in due time.

THE VENGEANCE OF THE JEWS

Perhaps these reforms are the cause of the present tranquillity, because the revo-

lutionary leaders nearly all belong to the Jewish race and the most effective revolutionary agency is the Jewish Bund, which has its headquarters at Bialystok, where the massacre occurred last June. The government has suffered more from that race than from all of its other subjects combined. Whenever a desperate deed is committed it is always done by a Jew, and there is scarcely one loyal member of that race in the entire Empire. The great strike which paralyzed the Empire and compelled the Czar to grant a constitution and a parliament was ordered and managed by a Jew named Krustaleff, president of the workingmen's council, a young man only thirty years old. He was sent to the penitentiary for life, and had not been behind the bars more than three weeks when he organized and conducted a successful strike of the prison employees.

Maxim, who organized and conducted the revolution in the Baltic provinces, is a Jew of marvelous ability. Last fall he came over here lecturing and collecting money to carry on the revolutionary campaign, but for some reason has vanished and nobody seems to know what has become of him.

Gerschunin, the most resourceful leader of the terrorists, who was condemned to life imprisonment in the silver mines on the Mongolian frontier, has recently escaped in a water cask, and is supposed to be in San Francisco. He is a Polish Jew only twenty-seven years old. I might enumerate a hundred other revolutionary leaders and every one of them would be a Jew. Wherever you read of an assassination or of the explosion of a bomb you will notice in the newspaper dispatches that the man was a Jew. The most sensational and dramatic episode that has occurred since the mutinies was on October 27, when, in the very center of Saint Petersburg, at the entrance of Kazan Cathedral, four Jews held up a treasury wagon and captured $270,000. They passed the package to a woman, who instantly vanished, and no trace of her has ever been found; but they were all arrested and were promptly punished. On the 8th of November a few Jewish revolutionaries entered a treasury car near Ragow, in Poland, got $850,000, and disappeared.

Every deed of that kind is done by Jews, and the massacres that have shocked the universe, and occurred so frequently that the name "pogrom" was invented to describe them, were organized and managed by the exasperated police authorities in retaliation for crimes committed by the Jewish revolutionists.

MANY REFORMS ALREADY INSTITUTED BY PREMIER STOLYPIN

But Mr Stolypin has evidently arranged a truce. He has crushed out the conspirators in the police department who organized and directed the "pograms" and has given the Jews more liberty and more justice than they ever enjoyed before. He has appointed a commission to prepare a law placing them upon the same footing as Protestants, Roman Catholics, and members of other religious faiths.

Mr Stolypin is an able, honest, and grave man, of broad horizon and liberal views and a high sense of justice. He has already done wonders. Every week some important reform is ordered, some tyrannical regulation revoked, some liberty conferred, some concession granted. He has emancipated the heretical sect of the Orthodox Greek Church known as the "Old Believers," who have been persecuted almost as cruelly as the Jews. They are now allowed to own property and build schools and publish books containing their doctrines; they are allowed to marry without the sanction of the Orthodox Church; their sons are admitted into the military schools and are eligible to positions in the civil service.

Stolypin has also removed the ban which prevented peasants from entering the civil service, which is one of the most striking departures from the traditional regulations of the autocratic régime. He has removed all distinctions concerning appointments under the state.

XUM

He has endeavored to bring the peasants to the support of his administration by hastening the distribution of land which they have so long and so earnestly demanded. He has appointed a commission to survey, appraise, and allot the crown and state lands as fast as leases expire or can be canceled. He has purchased a number of large estates from private proprietors who were willing to sell and is trying to settle the land question himself before the new douma can take it out of his hands.

He has remitted to the peasants their arrears in payment for lands now occupied and for back taxes to the amount of $37,500,000. He has issued a law permitting peasants to mortgage their lands to obtain money for improvements, for the purchase of implements, and for obtaining additional land. To prevent extortion, the transaction must be conducted with government banks and the rate of interest is fixed.

After January 1 peasants may select their own residences, which has never been permitted before. They can live where they like and move about the Empire at pleasure. Heretofore they could not leave their birthplaces without the permission of the elders. He has released them from the communal system, which was tyrannical, and has relieved individuals from responsibilities for the debts of the community. Peasants may now enter educational institutions and obtain civil employment without presenting discharge papers to show that they have done military service. In other words, all Russian subjects of whatever rank or station, of whatever religion or race, have been placed upon an equality.

Stolypin has reduced the working day of employees in government shops from twelve to ten hours; he has a commission engaged in drawing up a broad system for universal primary education which will involve an expenditure of $103,000,000 annually. He has made a grant of five million roubles, chargeable to next year's budget, for the erection of school-houses in the rural districts, and has issued an order to the education department to increase the salaries of school-teachers.

In addition to these reforms already granted, Mr Stolypin is preparing a number of important measures which will be laid before the douma when it meets. Many of them are intended to specify the rights, liberties, and privileges granted by the Czar in the fundamental law or constitution proclaimed on the 10th of May last. These concern politics, the press, public meetings, and are generally liberal, but prohibit personal abuse and intemperate criticism of the government. There are several laws in preparation for the benefit of the working classes, including state insurance, the liability of employers for accidents, and other measures borrowed from Germany. It is proposed to increase the revenues by an income tax on the same basis as that of England, and by making the importation and sale of tea a government monopoly, like the manufacture and sale of liquor. In case a moderate and conservative douma is elected Mr Stolypin will submit the draft of a law bringing the officials of the government within the jurisdiction of the courts, which will destroy the most vital prerogative of the bureaucracy.

THE GRAND DUKES HAVE YIELDED TO THE INEVITABLE

There is no evidence that the grand dukes or other reactionaries are interfering with these reforms; I have the highest authority for saying that the Empress Dowager and the Grand Duke Vladimir approve them, and if the Czar permits them to be carried out he may recover the confidence and the loyalty of his subjects. When a ruler has lost his faith in his people, and a people have lost faith in their ruler, the case is almost hopeless. Everybody in Russia agrees that the autocracy must go; even the imperial family admit that it is out of fashion and inconsistent with modern civilization. However, it is perfectly

natural that the Czar of all the Russias should object to the surrender of his power and prerogatives, inherited from a long line of autocrats. But sooner or later he will be divested of them. Already, as you have seen, many of them have been stripped off. His weakness, however, is the safety of the Empire. Every thoughtful man among the Liberal party prays, if he prays at all, that the life of Nicholas II may be preserved, for his vacillation and indecision furnish an elasticity that is like a spring in the bumpers of a railway car to soften the shock of frequent collisions between the people and the autocracy. In other words, the Liberal leaders believe that it is much better for the present peace and the future welfare of Russia to have a weak man rather than a strong man to deal with, and that his frequent changes of policy and his infirmity of purpose will serve them better than the stubborn resistance of a stern and determined sovereign, as his father was.

Although the Czar is a voluntary prisoner, his life is not in danger, except from some insane assassin. Nevertheless there is an always-present apprehension of danger.

His Majesty's proclamation dissolving the douma was pasted upon the door of the Tauride Palace, in which the parliament met, and was signed in large letters with His Majesty's name. Some irreverent person, with the spirit of prophecy, erased the signature "Nicholas II" and inserted "Nicholas the Last."

THE SECOND DOUMA

The second douma was elected in February, 1907, and organized in the month following. By the arbitrary restriction of the right of suffrage to certain classes, the government reduced the Radical majority considerably, and secured the election of about thirty reactionaries or absolute monarchists. During the first month of the session the proceedings were much more moderate and businesslike than those of the first douma, and, on the other hand, Mr Stolypin and his associates showed a conciliatory disposition toward that body in striking contrast with the attitude of the previous ministry. The Constitutional Democrats, however, who, with the assistance of the Radicals, have an overwhelming majority, are inclined to insist upon the same sweeping reforms that were demanded by the first douma, and at this writing do not promise any practical or useful legislation.

It is useless to predict what will happen in Russia: but the autocracy is ended. A constitution and a parliament have been given to the people and cannot be recalled. It is one of the great mysteries of Providence, which our feeble minds have never been able to solve, that human liberty must be bought with suffering and blood; but it would seem as if we were entering upon a new period. There has been comparatively little bloodshed in Russia, and in China and Persia a peaceful regeneration of their governments is going on. The year 1906 will ever be memorable in the history of civilization because it has seen the dissolution of three despotisms and the establishment of representative governments upon their ruins. Only two despotisms still remain among the nations of the earth—Siam and Turkey; but the King of Siam has an American adviser, and the Great Turk dare not go outside the walls that inclose his palace.

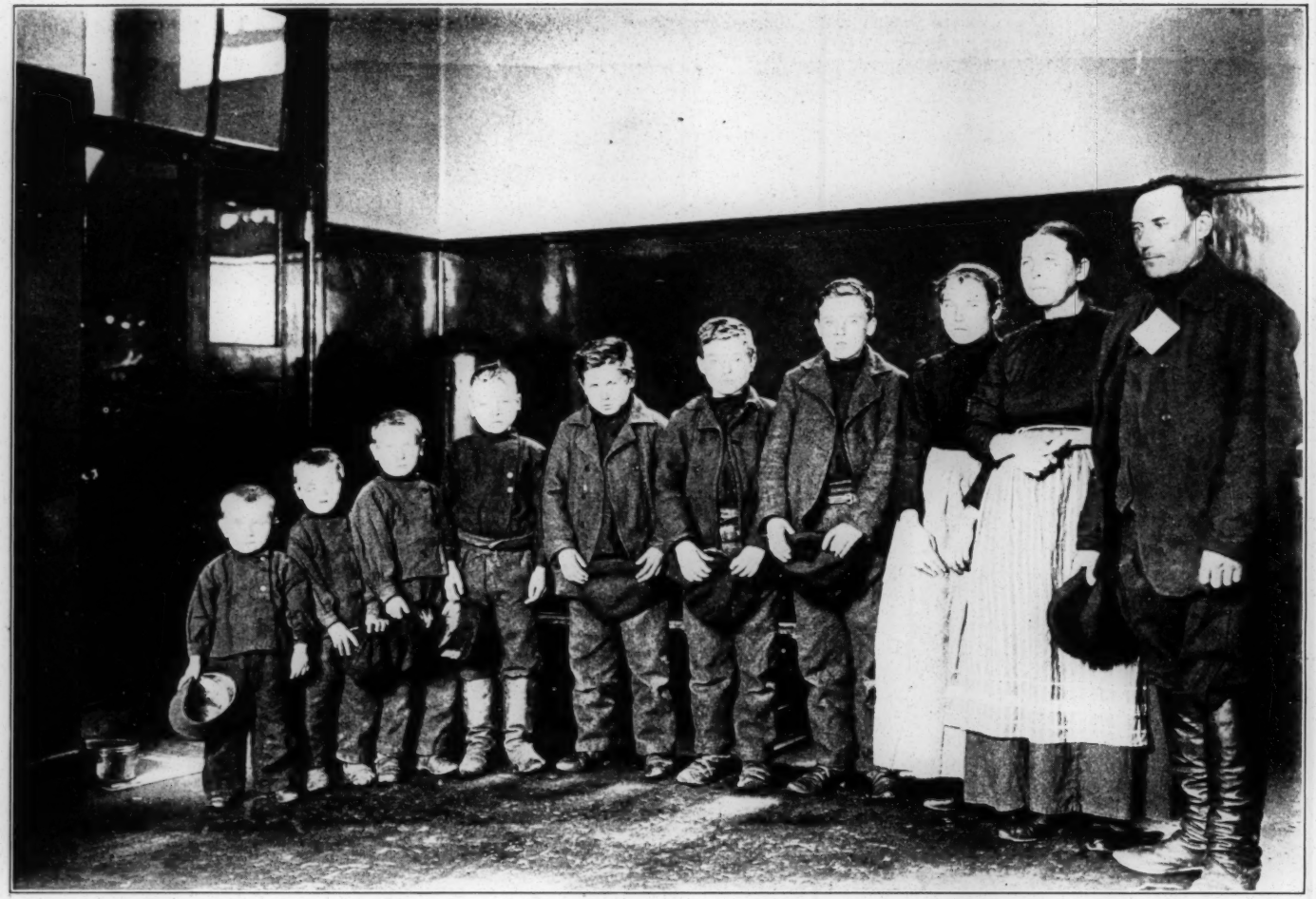
Cossack Immigrants, of whom about 5,500 were admitted in 1906

SOME OF OUR IMMIGRANTS

THE following series of illustrations, showing different types of the immigrants who are now pouring into the United States in even greater numbers than in 1905 and 1906, were obtained through the courtesy of Hon. F. P. Sargent, Commissioner General of Immigration. The immigrants were photographed immediately after disembarking, and are here shown just as they landed, most of them being still clad in their native costume, which will be discarded, however, within a few hours.

No migration in history is comparable to the great hordes that have crossed the Atlantic during the past 20 years to enter our territory. In 1905, 1,026,499 immigrants were admitted; in 1906, 1,100,735, and in the present year the total will exceed the record of 1906 by many thousands. Since June 30, 1900, 6,000,000 have been admitted, of whom probably 5,500,000 have settled permanently in the United States.

The report of Mr Sargent for 1906, recently issued, contains much interesting information about the character and qual-



A German Family of One Daughter and Seven Sons

While the proportion of Germans arriving is much less than in former years, considerable numbers are still seeking the United States, the total in 1906 being 86,813. Less than one-half of these, 37,564, came from Germany

A Scotch Family of Seven Daughters and Four Sons

The United Kingdom sent us 102,193 immigrants in 1906, as follows: England, 49,491; Ireland, 34,995; Scotland, 15,806; Wales, 1,841. More than two thirds of our total annual immigration are men and boys, the figures for 1906 being 764,463 males and 336,272 females

Typical Russian Hebrew Family

153,748 Hebrews were admitted in 1906. This year the number will be greater. They come principally from Russia

Finnish Girl

Russian Sisters

14,000 Finns arrived in 1906. The Russian Empire contributed 215,665 of our immigrants in 1906, most of them being Hebrews

Finnish Family

Alsace Lorraine Girl

Polish and Slovak Women

135,000 of these people were admitted in 1906

Ruthenian Girl

Typical Southern Italian Girl

286,814 Italians arrived in 1906, of whom 240,528 were from Southern Italy and Sicily. The Ruthenians come from Galicia, in Austria-Hungary, and numbered 16,257

Holland Children

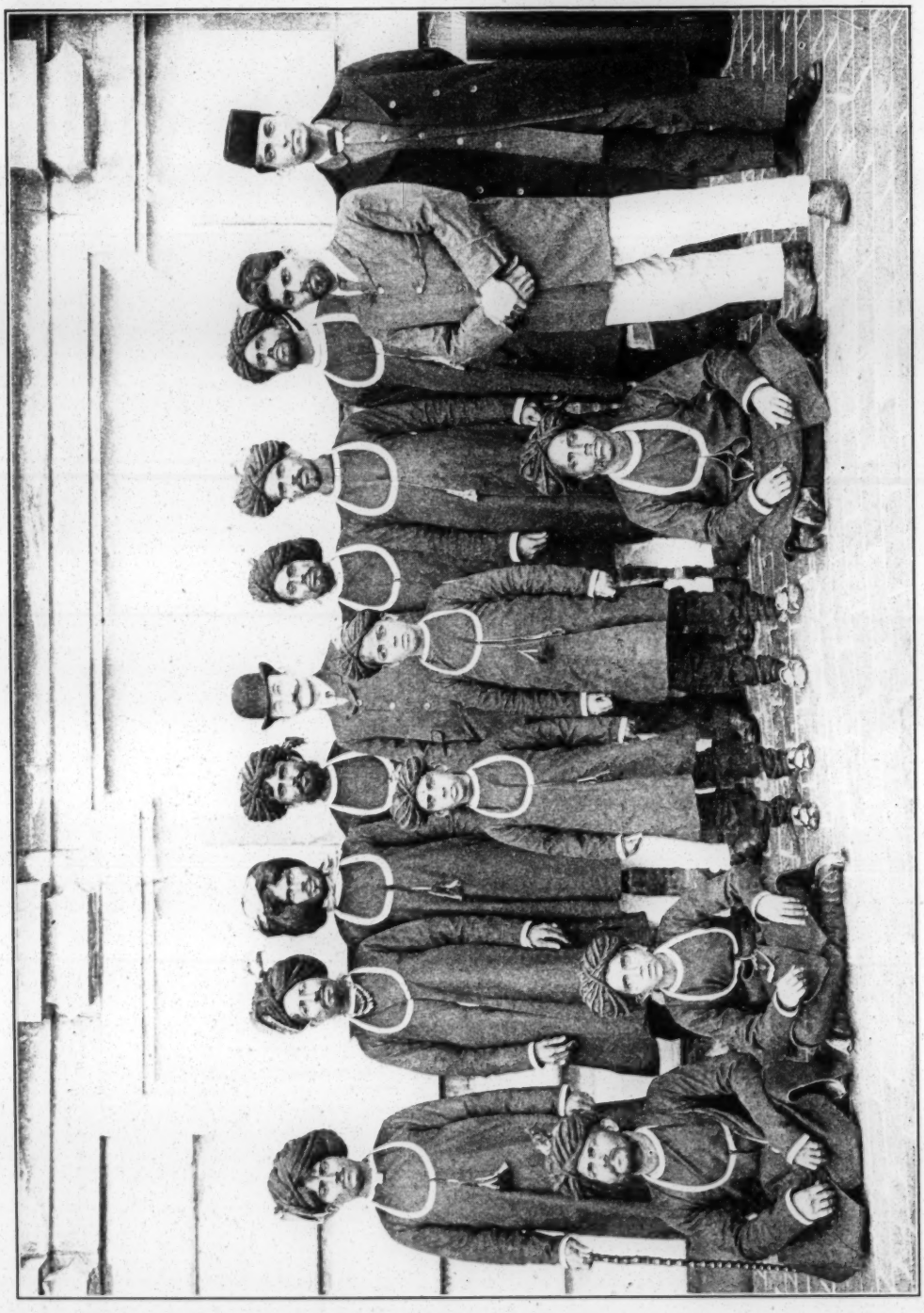
Holland Women

About 5,000 of these people arrive yearly

Typical Roumanian Peasant

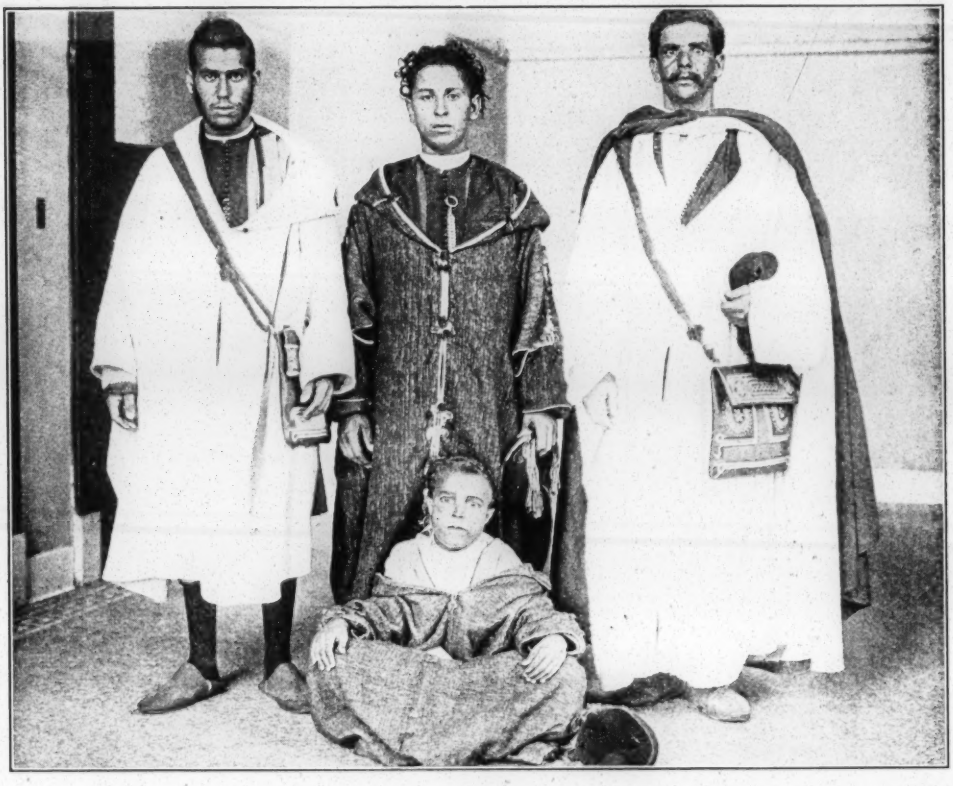
Little Roumania sent us 4,500 of her men and women in 1906

Roumanian Shepherd's Family as They Appeared on landing in New York



Hindoos and Parsees

Less than one hundred arrived last year



Arabs

Only a few representatives of this people come to the United States

ifications of the immigrants. Perhaps the most striking fact is that less than 5 per cent of the newcomers have reached or passed the age of 45. Of the arrivals in 1906, 913,955 ranged in age from 14 to 44, 136,273 were less than 14 years of age, and only 50,507 had reached or passed the age of 45. More than two-thirds of the immigrants were males, the figures being 764,463 men and boys and 336,272 women and girls.

About 28 per cent of the total number were illiterate, which is a very large proportion when we consider that only 6.2 per cent of the total white population of the United States and only 4.6 per cent of the native-born whites in 1900 were illiterate.

The immigrants brought to the country cash amounting to $25,109,413. It is exceedingly interesting to note the difference in financial condition between certain of the races. For instance, while the number of Hebrew aliens admitted was more than three times as great as the number of English, the former brought $2,362,125 with them and the latter $2,610,439, while the 144,954 Germans and Scandinavians brought $5,091,594; the 263,655 South Italians and Greeks brought only $4,183,398, and while 16,463 Scotch were able to show $820,759, more than twice as many members of the Slovak race produced only $526,028.

There were debarred during the year 12,432 aliens, of whom 2,495 belonged to the Hebrew race, 2,121 to the Italian,

Hungarian Family

1,000 to the Polish, and 1,867 to the German.

More than one-third of the entire number of immigrants—374,708—stated that they intended to stay in the State of New York, while one-sixth of them—198,681—asserted that they were going to Pennsylvania; 86,539, or about one-twelfth, were avowedly destined to Illinois; 73,863 intended to reside in Massachusetts, and 58,415 were en route to New Jersey; 880,036 entered through New York, 62,229 through Boston, 54,064 through Baltimore, 23,186 through Philadelphia, 6,201 through Galveston, and 2,051 through New Orleans.

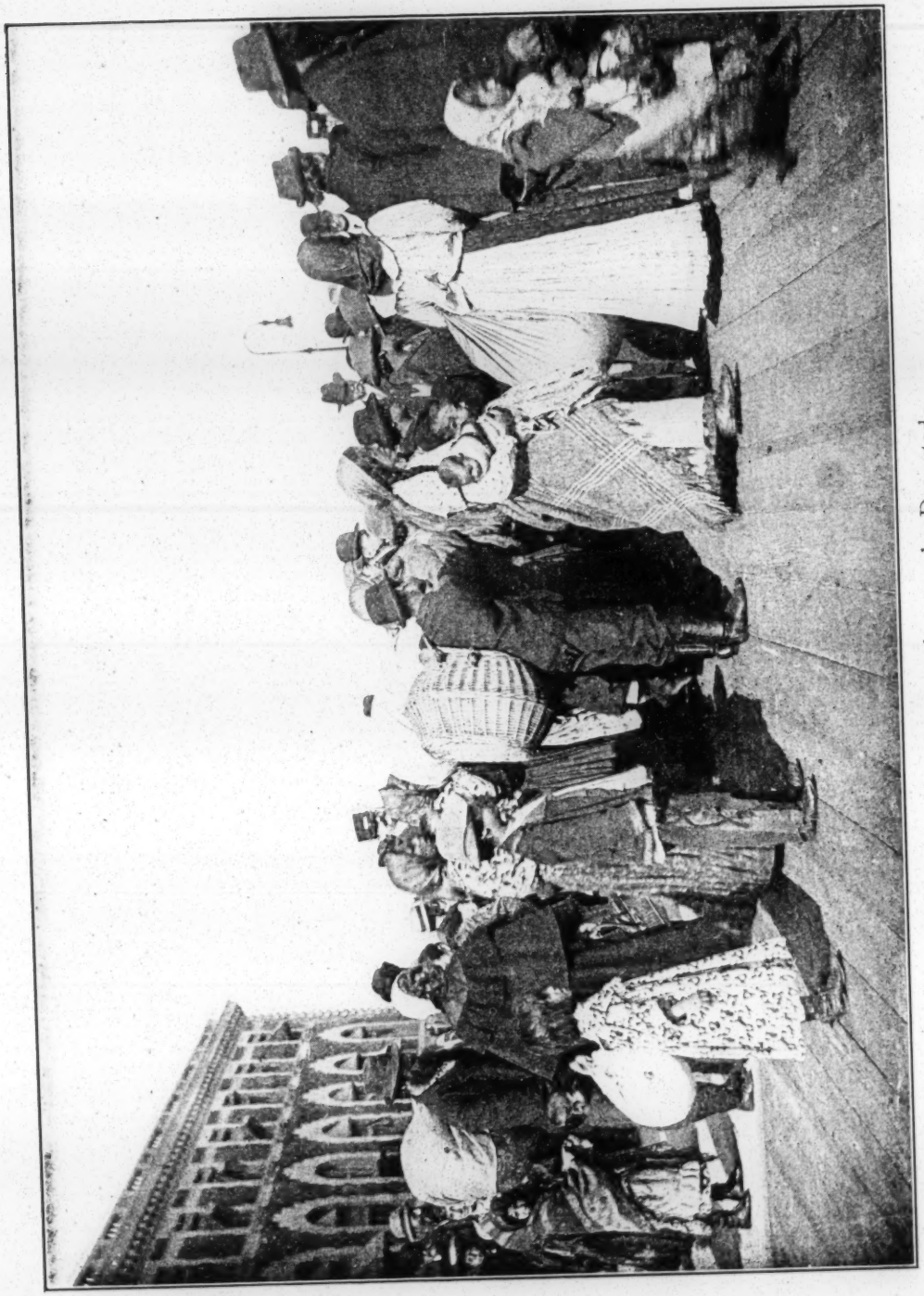
Immigrant Aliens Admitted into the United States, by Countries, During the Fiscal Year Ended June 30, 1906

Austria	111,598
Hungary	153,540
Belgium	5,099
Bulgaria, Servia, and Montenegro	4,666
Denmark	7,741
France, including Corsica	9,386
German Empire	37,564
Greece	19,489
Italy, including Sicily and Sardinia	273,120
Netherlands	4,946
Norway	21,730
Portugal, including Cape Verde and Azore Islands	8,517
Roumania	4,476
Russian Empire, and Finland	215,665
Spain, including Canary and Balearic Islands	1,921
Sweden	23,310
Switzerland	3,846
Turkey in Europe	9,510
United Kingdom:	
England	49,491
Ireland	34,995
Scotland	15,866
Wales	1,841
Other Europe	48
Total Europe	1,018,365

Servian Gypsies

Children's Roof Garden, Ellis Island

Here the immigrant children, who are temporarily detained, romp and play until their parents or guardians come for them



Excluded Gypsies about to be Deported

China	1,544
Japan	13,835
India	216
Turkey in Asia	6,354
Other Asia	351
Total Asia	22,300
Africa	712
Australia, Tasmania, and New Zealand	1,682
Pacific Islands, not specified	51
British North America	5,063
British Honduras	80
Other Central America	1,060
Mexico	1,997
South America	2,757
West Indies	13,656
United States	32,897
All other countries	115
Grand total	1,100,735

The new immigrant law, which goes into effect July 1, contains important restrictions which will enable the immigrant officials to debar imbeciles, weak-minded and other undesirable classes with greater effectiveness than in the past. It also contains a provision preventing the entrance of children under 14 years of age unless accompanied by, or plainly intended for, the parent or guardian. The law also increases the head or entrance tax on each immigrant from $2 to $4.

While the law defines more sharply the undesirable classes, it is doubtful if it will reduce the number of immigrants now seeking our land.

THE BLACK REPUBLIC—LIBERIA*

By Sir Harry Johnston and U. S. Minister Lyon of Monrovia

IT will be seen on the map that Liberia occupies a most important strategic position on the west coast of Africa between 5° and 8° north latitude. The general trend of the coast, which is about 400 miles long, is from northwest to southeast, parallel to the course taken by steamers plying across the Atlantic between Europe and South Africa. It might, in fact, in the hands of a strong naval power, exercise a very dominating influence over the eastern Atlantic, which is one reason, among many others, why Great Britain desires to see the independence of the Liberian Republic preserved and maintained.

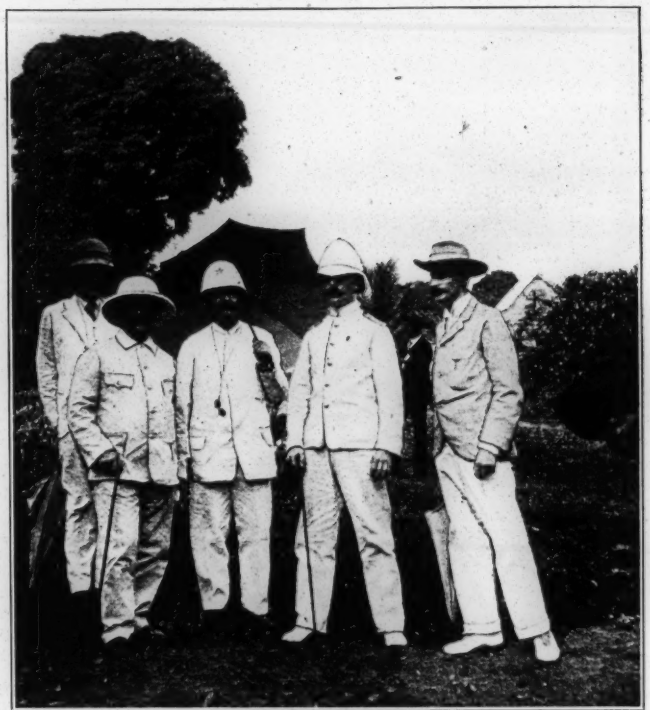
The country of Liberia as a whole is one dense forest. It is practically the culmination of the West African forest, the regions to the north, east, and west having been more extensively cleared by man in past times, or partaking more of the park-land, grass-grown character, owing to their less copious rainfall. Now that two English companies, in conjunction with the government of Liberia, are endeavoring to develop the resources of the interior and to accumulate knowledge regarding the climate and products, attempts are being made to record the rainfall, as to the extent of which at present only a guess can be made. It is probable that south of latitude 8° 30′ the average annual rainfall of Liberia is not less than 100 inches. Adjoining regions in Sierra Leone have a recorded rainfall of something like 130 inches, so that this is probably an under rather than over estimate. North of latitude 8° 30′ the rainfall diminishes to probably 60 to 80 inches per annum, and in consequence the dense forests give way to a pastural coun-

* This article is abstracted from several interesting reports recently made by Sir Harry Johnston and Minister Lyon on this negro republic, which was founded by some philanthropic Americans 90 years ago. For further information the reader is referred to the Consular Reports of the Department of Commerce and Labor and to two magnificent volumes, "Liberia," by Sir Harry Johnston, published by Dodd, Mead & Co. This work is very handsomely illustrated.

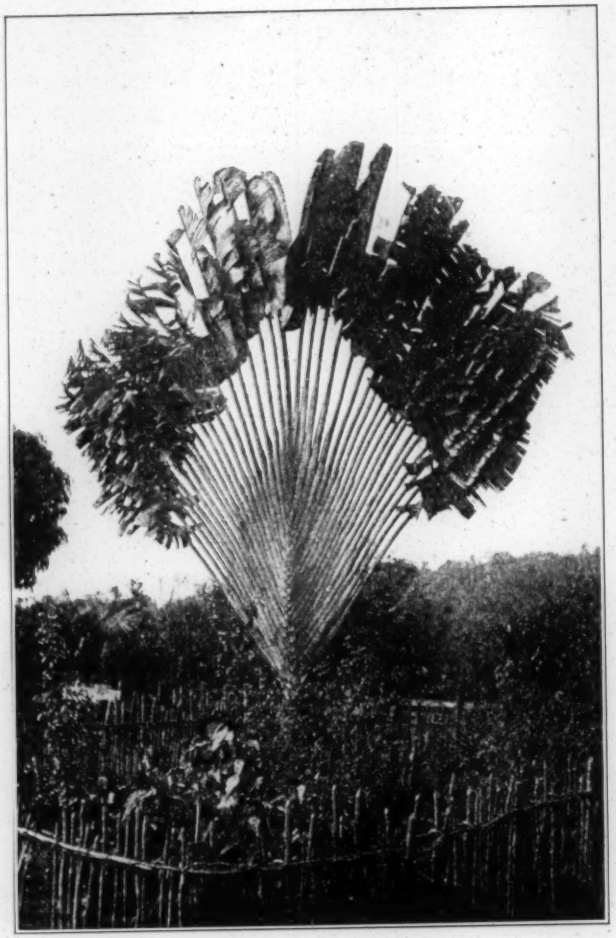
try of savannas, grassy hills, or park-land of grass, with dense forests along the stream valleys.

When I visited the coast of Liberia in 1882 and 1885, says Sir Harry Johnston, the primeval forest grew down to the sea along a great proportion of the coast; but when I visited this country in the summer of 1904, where I had noted forest growing as late as 1888, much of this big-tree woodland had been swept away to make room for plantations or even for towns. In fact, with a few exceptions, the big-tree and rubber-producing forest does not usually begin in its most marked characteristics until a journey of at least 15 miles has been made inland from the coast.

I have estimated, from the reports of the agents of the British companies and from the accounts of Liberian, British, and French explorers that out of the 45,000 square miles which may be approximately assigned as the area of the Liberian Republic at least 25,000 square miles consist of dense, uncleared forest, penetrated, it may be, by narrow native paths, but as often as not pierced by elephant-made tracks. About 3,500 square miles represent the plantations, gardens, towns, and settlements of the Americo-Liberians along the coast, and 2,000 or 3,000 square miles the clearings made by the indigenous natives in the dense forests. The remainder of the territory—about



The Foreign Consuls at Monrovia
Two Native Kings, Liberia



Travelers' Fountain

The leaves contain water which the traveler drinks

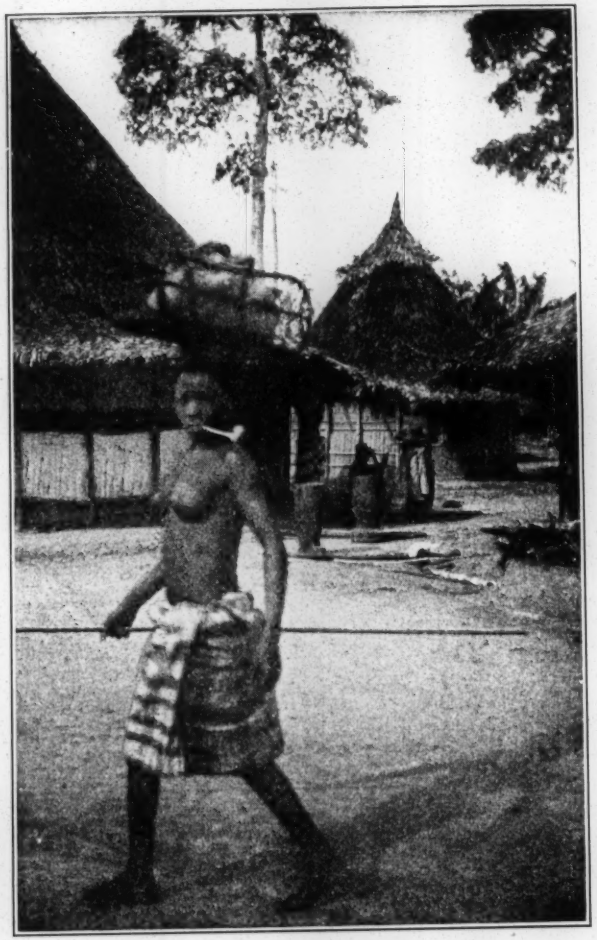
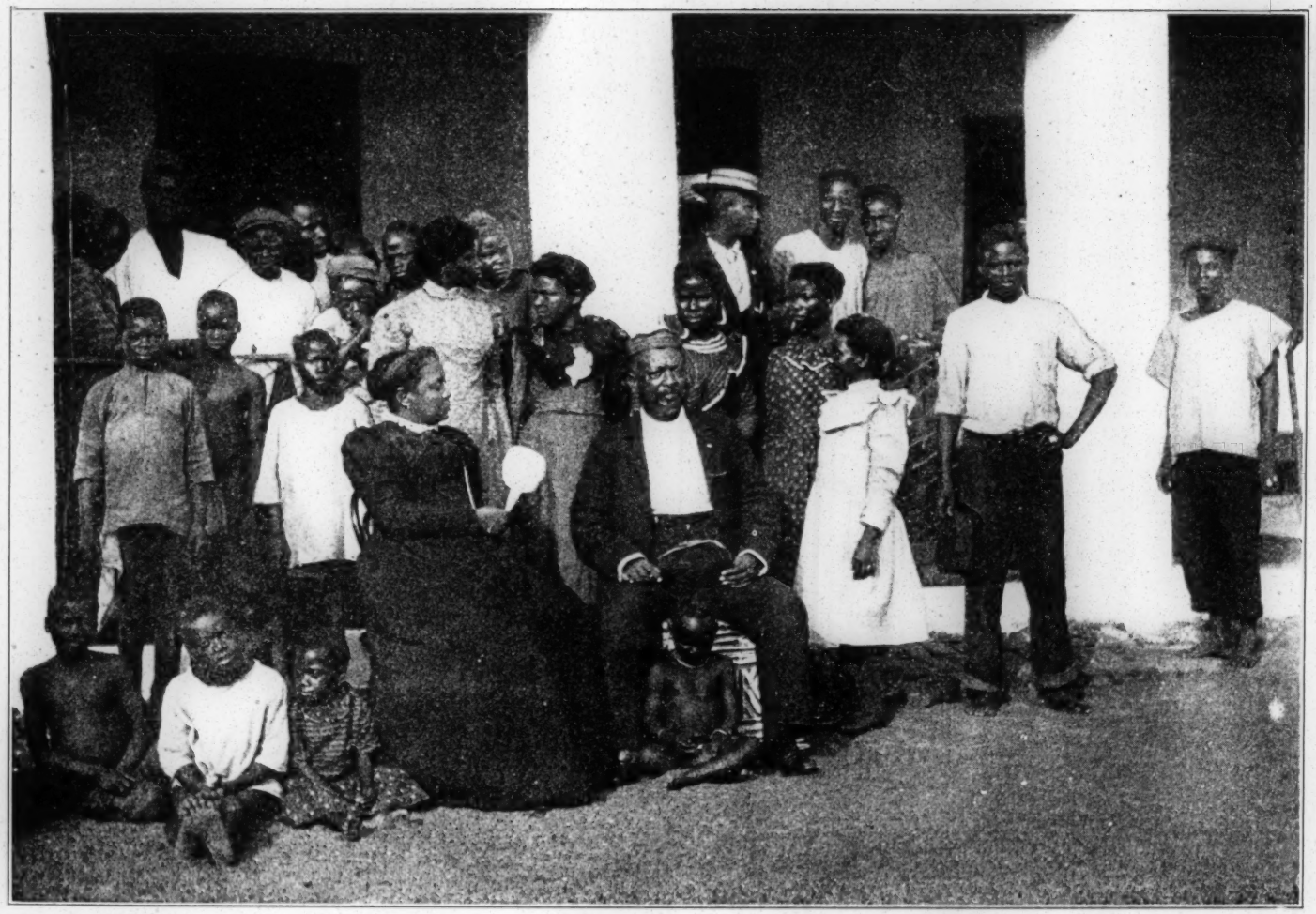


Photo by Douglas Hume

Village in Eastern Liberia



A Liberian Family and Native Children

The majority of the illustrations accompanying this article were taken by Ernest Lyon, U. S. Minister to Liberia, and were obtained by the NATIONAL GEOGRAPHIC MAGAZINE through the courtesy of Major Carson, Chief of the U. S. Bureau of Manufactures

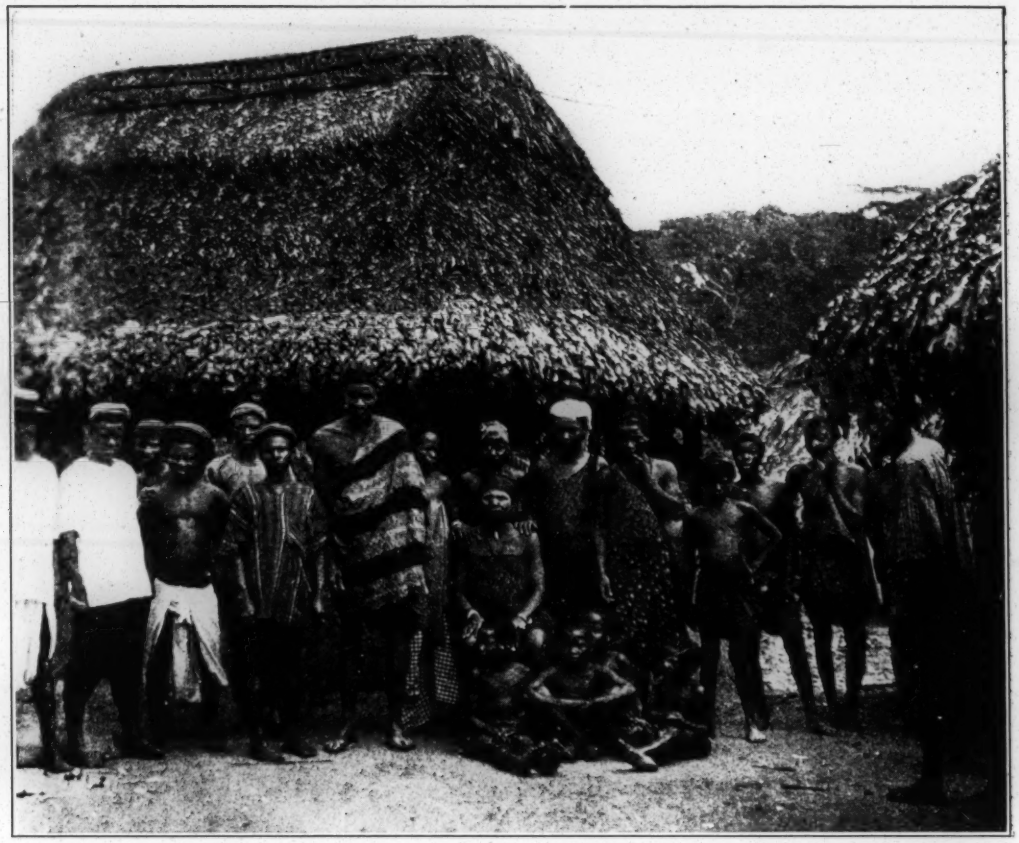
Women of the Solah Tribe, Liberia

15,000 square miles—is grass or park-land in the possession of the Mandingo tribes, who are great cattle-breeders. From all accounts I can collect, as well as from the little I have seen myself, I do not think that much of the interior of Liberia can be described as marshy. It is, on the other hand, inclined to be hilly, and at distances of from 40 to 100 miles inland ranges of hills reach altitudes which might almost be dignified by the name of mountains.

The population of Liberia consists of about 15,000 Americo-Liberians, descendants of negroes from the United States, and 2,000,000 indigenes. So far as the outside world is concerned, the world of treaties and congresses, the country which we know as Liberia is considered to belong to and be governed by this small caste of English-speaking negroes and half-breeds of American origin. These English-speaking negroes certainly govern and administer the coast-line and a belt of more or less settled country which extends from 20 to 40 miles inland. Of late years they have been on generally friendly terms with the 2,000,000 indigenous negroes, some of whom have come very much under their influence.

The Americo-Liberians are the survivors or the descendants of freed slaves or persons dissatisfied with their social condition in the United States of America during the early part of the nineteenth century. A considerable number of them also came from the British West Indies; but the movement which founded Liberia—the black republic on the west coast of Africa—originated with certain philanthropic societies in the United States about 1821.

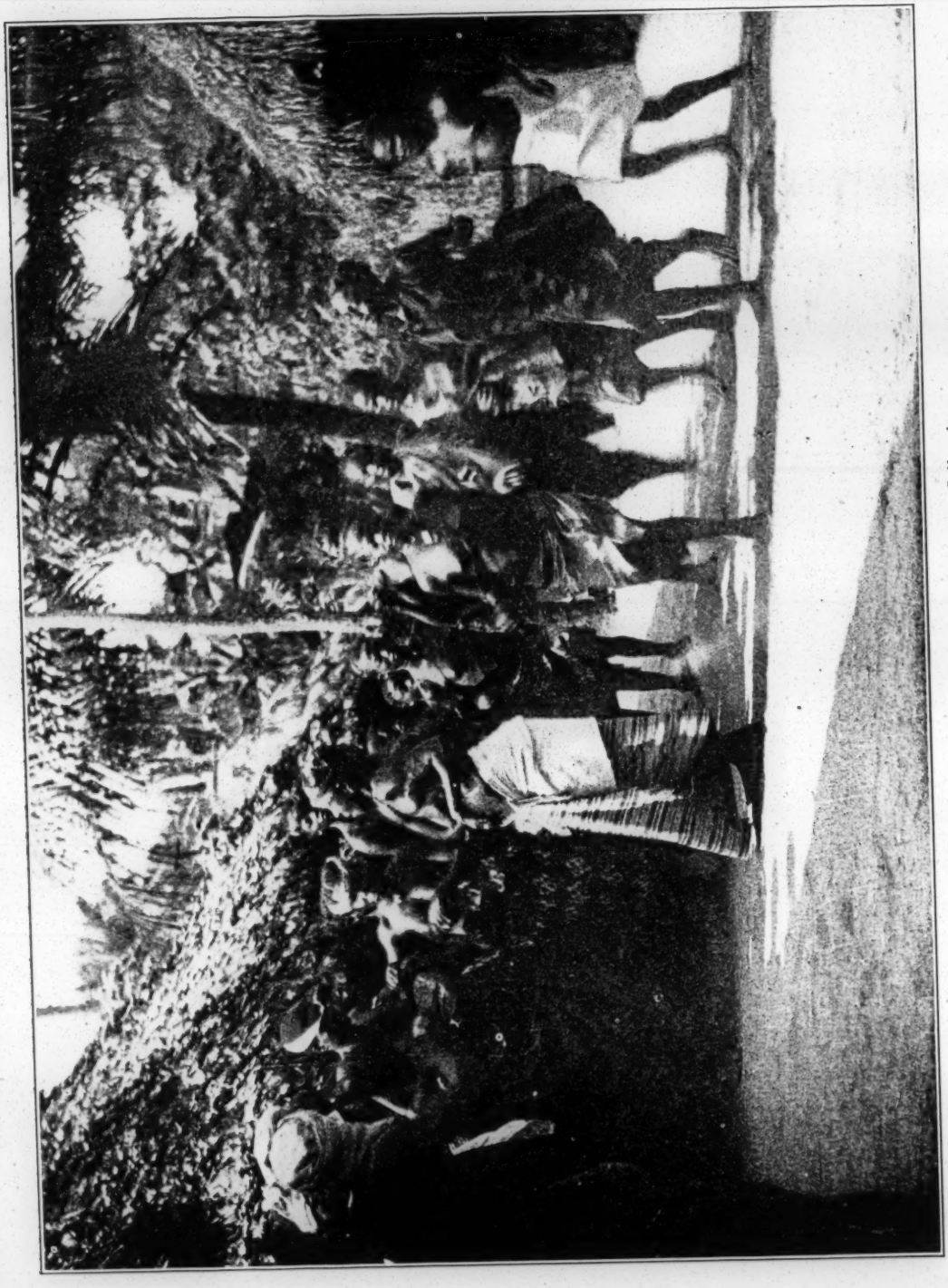
The first fifty years of the history of Liberia were marked by constant struggles between the Americo-Liberian in-



Entrance to a Native Town, Liberia

vaders and the native blacks. During the last ten years, however, there has been a marked advance in good relations between the American settlers and their native subjects, as many of them may fairly be called. The wise policy of President Barclay has greatly promoted this good feeling since 1904. He has been able to assemble at different times at the capital chiefs, or their representatives, from almost all parts of Liberia, even from the Mandingo districts, just beyond the limits of the coast belt. Curiously enough, one example of this mild rule of black by black is that the white man in Liberia is everywhere received with great friendliness, because he is not associated in the minds of the natives with anything like conquest or oppression.

How far the original experiment will succeed the next twenty years will perhaps indicate. The negroes of American origin who have settled in Liberia have not, as a general rule, been able to stand the climate very much better than Europeans, and, as a rule, they have not been able to rear very large families of children. Yet it seems to me, writes Sir Harry Johnston, as though Liberians of the new generation born in the country are beginning to take hold, but this is partly due to the increasing and, I think, very sensible practice of intermarriage with women of the fine, vigorous, indigenous races.



Dancers at a Funeral, Interior Liberia

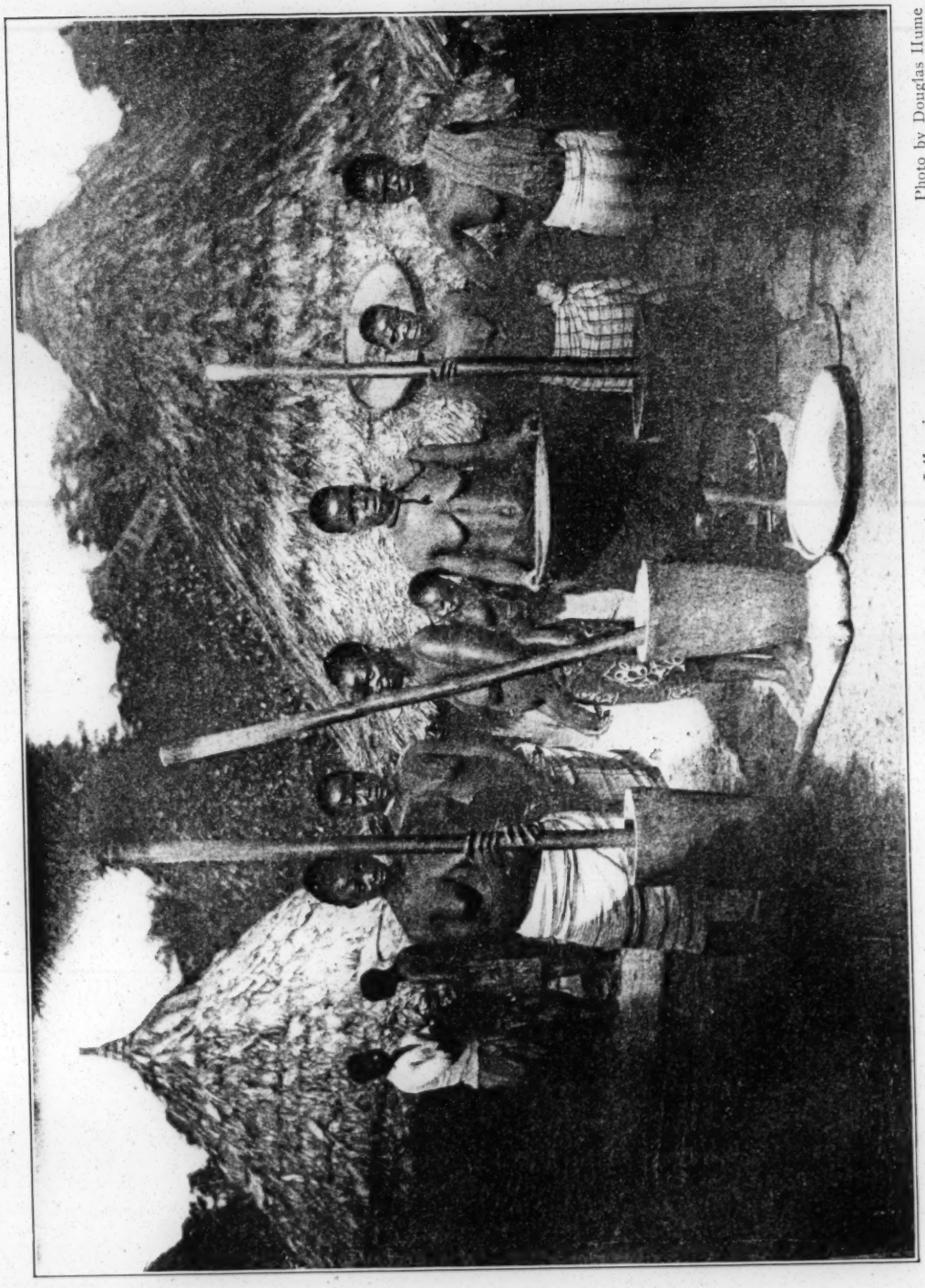


Photo by Douglas Hume

Women Grinding Corn, Interior Liberia

Compared with other parts of West Africa, I should say that Liberia is less unhealthy for the European than Sierra Leone, the Ivory Coast, the Gold Coast, or Lagos. But it is, perhaps, too soon to judge. It is noteworthy, however, that the remarkable absence of mosquitoes should, to a great extent, coincide with a less marked prevalence of malarial fevers.

From a European point of view, perhaps the most healthy part of Liberia is the northern half, and from all accounts it would be the Mandingo plateau that Europeans would prefer for their trading or mining setlements.

The great, undoubted wealth of Liberia lies in its rubber, but the trade in this product is as yet only in its infancy. Another important article of export in the future will be timber. Piassava, which is a fiber derived from the rind of the fronds of a raphia palm, figures to some extent in the exports, which also include coffee, a little cacao, ivory, copal, palm oil, palm kernels, ginger, camwood, and annatto.

The constitution is framed after that of the United States. There are a President, Vice-President, a council of six ministers, and a Senate and a House of Representatives. The total membership of both houses is 22. Voters must be of negro blood and own real estate. The natives generally do not avail themselves of the suffrage. No foreigner can own land without the consent of the government. The capital, Monrovia (named after President Monroe), has a population of about 2,500. There is a regular army of 1,000 men. The militia number 500. The annual budget balances at about $200,000, the revenues being usually somewhat in excess of the expenditures. Customs duties furnish most of the receipts.

The American consul general to Liberia, who has recently made several journeys into the unknown interior of Liberia, writes as follows:

"The absence of railroads and of every other vehicular convenience for travel in Liberia is a serious drawback to the development and prosperity of the republic. For this reason very few Liberians venture into the interior. Except soldiers and traders, the Liberians are absolutely ignorant of the interior of their country.

"We found no roads entitled to be called such leading into the interior, either to or from native towns. They are all crooked and labyrinthine. They are made crooked to mislead the enemy, and to render his approach to a town difficult during a tribal war. The aborigines give themselves no concern about obstacles in the road. They cut down a tree and leave part of the huge branches lying across the path. They never think of removing them except when compelled to do so by a Liberian commissioner. They prefer either to climb over or to go around, and to swim a creek rather than to take the trouble to cross it by the bridge. When an old road is abandoned it is flagged by placing a branch as an obstruction at the fork of the path. The native knows what this means and takes the new road. The reason given by the native for leaving obstructions in the roads and for making them narrow and winding is not only to bewilder the tribal foe, but also to render it difficult for the Americo-Liberian to find them in their native fastnesses.

NATIVE FUNERAL

"We arrived at one village in time to witness the burial ceremonies over the remains of the king's daughter, who had died three days previously. Her death was evidently occasioned by physical exhaustion. She undertook a journey of 40 miles three days after becoming a mother. Her relatives, however, concluded that her somewhat sudden death was due to witchcraft, and the whole town accordingly set about finding the witch. The memory of the dead was honored by the customary dance, which consisted of hideous yells and physical contortions, leaving the women in a

state of exhaustion and the men in a state of frenzy. The ceremony closed with repeated volleys from firearms, to announce to the spirits on the other side the coming of the departed. Upon the grave was left a brass kettle, some of the wearing apparel of the deceased, and some articles of food.

"To discover the witch the suspected party was forced to swallow poison made from the sassy-wood bark. According to the theory, the guilty cannot live with a dose of this concoction, but upon the innocent it will have no effect. Many innocent persons have been the victims of this superstition, until recently an antidote has been discovered, which the suspects carry concealed.

"Continual tribal wars in the interior have resulted in the depopulation of whole sections and in the extermination of thousands of families. The natives are always fighting, with the result that gold, ivory, and cattle, which formerly came to the markets of Monrovia, have been diverted into other directions because of better protection to life and property.

"Women are invariably the cause of every contention. Wealth among the aborigines is based solely on the number of wives, boys, and cattle possessed. The man who has the most wives can easily be king. The abduction of one of the wives of a Pessy man and the refusal to give her up when demand is made is *casus belli*. The men of a captured town are frequently put to death in the most cruel manner, while the women and children are reduced to abject bondage. Of these the king takes the lion's share and distributes the remainder among his followers. The children are frequently sold, pawned, or given to satisfy financial demands, very often among themselves, or to members of neighboring tribes, or sometimes to Liberians, who pay the price for them, and then keep them under the apprentice system until they reach maturity, when they are given their liberty, if they do not abscond in the meantime."

ORE-BOAT UNLOADERS

IN ore transportation the cost of the boat-loading and unloading is a large part of the expense. The surface mining with steam shovels, the gravity-car system to the ore docks, combined with the automatic ore chutes for boat-loading, enables many of the ore operators in the Upper Lake regions to place the ore in the boat very quickly and at a small cost. The largest boat may now be easily loaded in one or two hours with a cargo of 5,000 to 6,000 tons and with the employment of practically no hand labor.

The expansion of the ore market has developed special ore-boats, of which the *Augustus B. Wolvrin* is a good type. The length of 560 feet, a tonnage of 8,000, and an average speed of over twelve miles per hour were extraordinary features for inland boats a few years ago, but now the members of this class are numerous and the cheapest to operate. The season tonnage for each boat of the 500-foot class is enormous. In 1906 the *W. E. Corey* moved 302,547 tons of ore in 30 trips; this is more than a whole fleet would carry 20 years ago. With boats of such an enormous cargo, the time consumed in unloading is valuable, and the problem of how to quickly and cheaply discharge the heavy and bulky cargo has received much attention from engineers and ore-handling companies.

In the early days of ore shipping it would have required 50 men working with hand-filled buckets nearly 23 hours to unload a cargo of the *Augustus B. Wolvrin*, but at the present time such a cargo is removed from the hold and placed on the cars or in the stock piles in four or five hours. The saving in expense and time during a season for some 80 boats, which is the present number of the ore fleet, is no small amount. The great unloaders have gradually

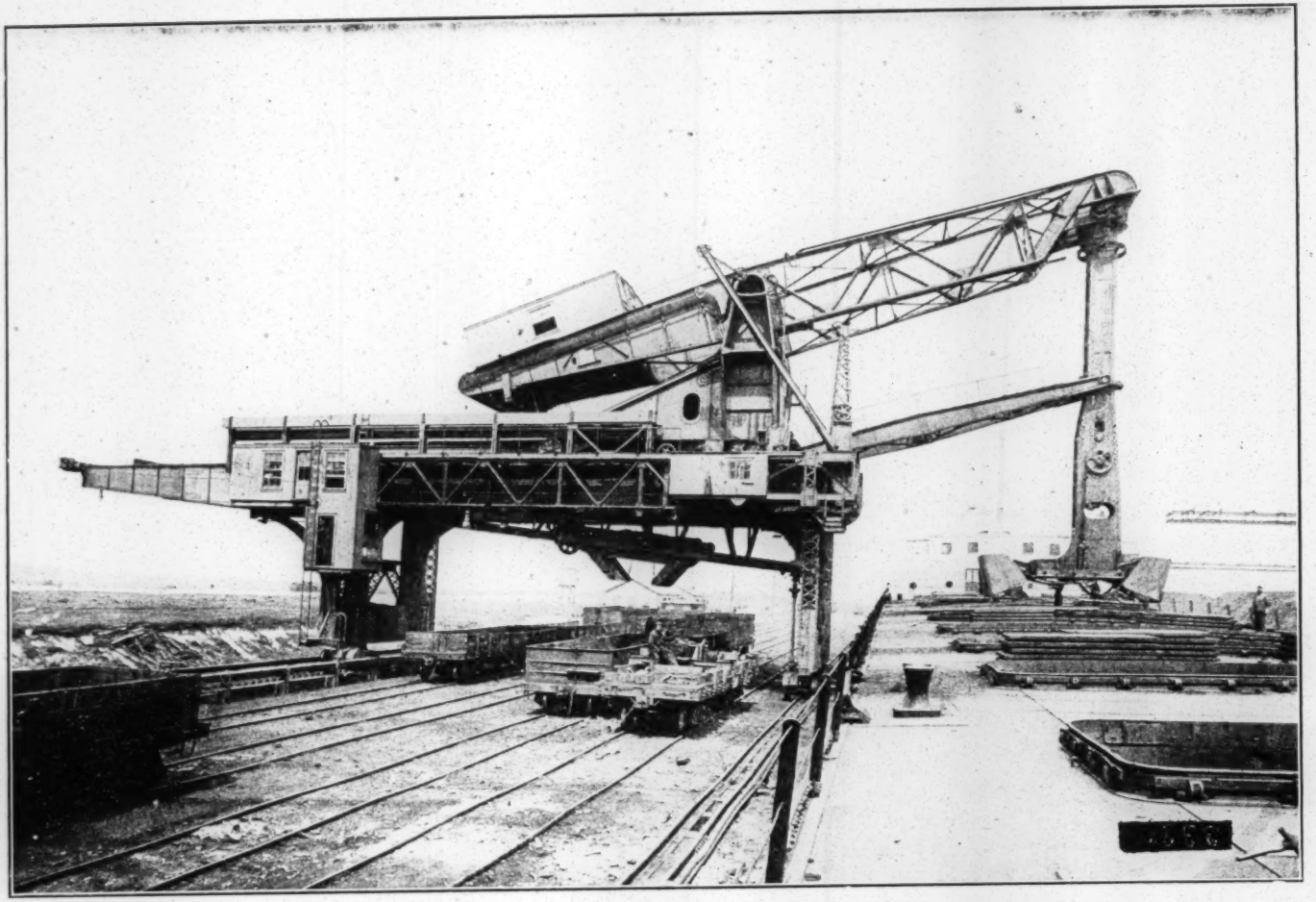


Photo from W. M. Gregory, of Cleveland, Ohio

Electric Ore Boat Unloader—the Heulett Type

The picture shows on the right the "grab bucket" about to descend in the hold of the boat. This bucket has a capacity of 10 tons and can be rotated in any direction and expanded the width of the hold. It requires the services of three men and no shovelers in the hold. A machine of this type has unloaded 681 tons of ore in one hour. These unloaders are built in series of three or four and unload a large ore boat in four or five hours

grown from the "whirlers" to the buckets on the bridge tram and into the electric "fast plants" of today.

The great modern unloaders are electrically operated and require a small amount of labor—not over three men. The first cost of the machines is high, but the time and labor saved proves their economy. The repair bill is low and the amount of dock room required to handle immense amounts of ore is small, which is a great advantage in some of the crowded ports on Lake Erie.

One of the most modern of these great machines is the Hulett 10-ton electric unloader. These machines are in operation at Conneaut, Lorain, Buffalo, and various other places, while a number are to be installed at Gary, Indiana. Each machine consists of two heavy parallel iron girders at right angles to the face of the dock and mounted on moving trucks which span four or more railroad tracks. On the two girders a carriage travels back and forth, carrying a long pivot walking beam. On the front, or the water end, of this walking beam is a vertical dependent leg, to which is attached the "grab" bucket. This leg always maintains a vertical position. The operator who controls the bucket rides in a cab on the lower end of the leg directly above the bucket. In operation the walking beam oscillates up and down, carrying the bucket down into the hold of the boat and up above the dock. The travel of the carriage back and forth on the heavy girders carries the walking beam and the bucket out over the boat and back over the dock.

The average "grab" of the bucket is nearly 10 tons, and one machine alone has taken out of a vessel's hold 681 tons of ore in one hour. Four of these great machines have removed 9,945 gross tons in four and a half hours. This is equivalent to filling a large freight car in 60 seconds or loading a train of 45 cars of 40 tons each in three-quarters of an hour With boats of so great a tonnage and unloaders of this great capacity, it will not be long before 50 million tons of iron ore will be moved in a single season. In 1906 38 million tons was the season's record, and with the prospective new boats and unloaders, nearly 48 million tons will be moved in 1907.—W. M. GREGORY, *Cleveland, Ohio.*

FACTORS WHICH MODIFY THE CLIMATE OF VICTORIA

BY ARTHUR W. MCCURDY, OF VICTORIA, CANADA

"HOW about your climate?" "Well, it is different from that of any other place that you have ever seen," and the new arrival in Victoria at once wants to know, "How is it different, and why is it different?"

If he arrives in July or August, the warmest months of the year, he finds a mean temperature of 60° Fahrenheit and a rainfall of less than an inch per month. If he arrives in January or February, our coldest months, he finds a mean temperature of 40° and a rainfall of less than three inches per month. There may be a light fall of snow, but it soon passes away. In July and August he finds the grass brown and dry; in January and February it is green everywhere. He, too, realizes that the climate of Victoria is different from that of any other place that he has ever seen.

On the accompanying map of North America I have marked points having a mean temperature of 60° Fahrenheit for July and August and those having a mean temperature of 40° Fahrenheit for Jan-

Summer and Winter Isothermal Lines of Victoria, B. C.

uary and February, joining them by an isothermal line running from ocean to ocean.[1]

The summer isotherm of 60° after leaving Victoria enters the mainland north of Vancouver and runs inside the coast line as far north as the Yukon; then, bending southeast, it passes south of Hudson Bay, north of Quebec, and enters the Atlantic at Sydney, Nova Scotia. South of this line it is hotter than in Victoria in July and August, and north of it it is colder.

The winter isotherm of 40°, after leaving Victoria, enters the mainland at Seattle and runs inside the coast line as far south as Phœnix, Arizona; then, crossing the southern states, enters the Atlantic at Norfolk, Virginia. South of this line it is warmer than in Victoria in January and February, and north of it it is colder; so that, on the Pacific coast, in Victoria, we find the temperature of Nova Scotia in summer and that of Norfolk, Virginia, in winter. This is the more remarkable when we consider that Victoria is 150 miles farther north than Sydney and 700 miles farther north than Norfolk.

In this connection it is interesting to glance at the absolute maximum and minimum surface temperatures of the following cities of North America for 1905 as reported in the U. S. Weather Bureau Summary for that year, Chart XIV:

	Highest.	Lowest.
Victoria	84	23
Winnipeg	87	-39
Toronto	92	- 6
Montral	87	-12
Quebec	90	-19
Sydney	88	-13
Boston	94	3
New York	96	0
Washington, D. C.	95	- 2
Norfolk, Va.	95	12
Atlanta, Ga.	93	2
Jacksonville, Fla.	95	17
New Orleans	95	18
Oklahoma	98	-11
Phœnix, Arizona	116	26
St. Louis, Mo.	96	-18
Chicago	95	-18
Salt Lake City	97	- 4
Sacramento	110	28
Portland, Oregon	99	17
Seattle	90	20

It will be noticed that all other cities mentioned have both a higher and lower temperature than Victoria, with the exception of Phœnix, Arizona, and Sacramento, California, in which cases the winter minimum is not so low as at Victoria.

The following table affords a comparison of Victoria's average rain and snow fall with that of other Canadian cities for a 20-year period:[2]

	Rain.	Snow.
Victoria	30.2	17.6
Winnipeg	15.2	49.4
Montreal	30.1	123.4
Sydney, N. S.	42.6	83.6

From the above it will be seen that the average rainfall of Victoria is similar to that of Montreal, Winnepeg's being less and Sydney's greater, and that the snowfall of Victoria is one-seventh of that of Montreal, one-fifth of that of Sydney, and one-third of that of Winnipeg.

The following table gives the absolute

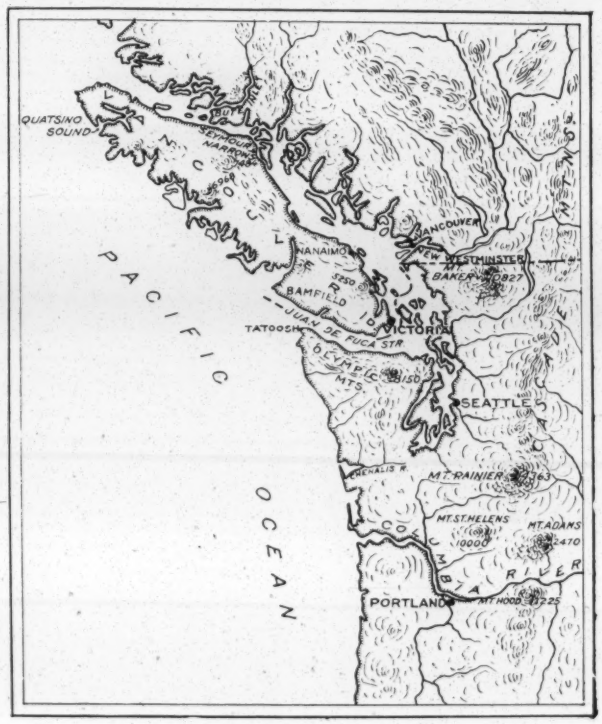
rain and snow fall in inches during 1905 in—[3]

	Rain.	Snow.
Victoria	23	5
Winnipeg	16	42
Montreal	25	130
Sydney, N. S.	36	125
Boston	28	45
New York	38	58
Washington, D. C.	47	41
Norfolk, Va.	42	12

With the exception of Winnipeg, the rainfall in Victoria is less than that in any other city mentioned, and Victoria's snowfall is the least of all.

To go still further into detail, the following table gives the rain and snowfall in Victoria for each month of 1905 and up to December 19, 1906:[4]

Month.	1905 Rain.	1905 Snow.	1906 Rain.	1906 Snow.
January	2.89	4.50	2.27	2.09
February	2.27		1.66	
March	1.39		0.67	T
April	0.21		0.46	
May	2.81		1.81	
June	1.06		0.65	
July	0.10		0.16	
August	1.21		0.53	
September	4.03		3.14	
October	2.81		5.60	
November	0.91		6.13	
December	2.82		2.40	0.30
Total.	22.51	4.50	25.48	3.20



Outline Map Showing the Situation of Victoria, B. C.

These remarkable conditions are so startling that we at once look to the geographical features surrounding Victoria for the answer to the question, "Why is the climate different from that of any other place that we have ever seen?"

The accompanying map shows high mountain ranges at a distance of 40 to 100 miles from Victoria, with an opening to the Pacific between the Olympic Mountains and the mountains of Vancouver Island. In this opening lies the Strait of Juan de Fuca (20 miles wide), with low-lying lands and foothills on both sides of it. Through this gap in the mountains the prevailing southwest, west, and northwest winds, modified by the temperature of the ocean (60° F. in summer and 45° F. in winter), have free access to Victoria. They give us a temperature comparatively cool in summer and warm in winter, and carry much of their moisture beyond us, to be precipitated on the distant mountain ranges.

The south winds from the Pacific in passing over the lofty Olympic Mountains drop their moisture there in the form of rain or snow and come to us as cool and dry winds.

The following table will afford comparison between the precipitation at Victoria and at stations nearer the mountain ranges upon Vancouver Island and the mainland:[5]

PRECIPITATION DURING 1905, IN INCHES

Victoria, B. C.	22.51
Tatoosh, U. S. A.	63.74
Bamfield, B. C.	53.43
Nanaimo, B. C.	42.80
New Westminster, B. C.	52.87

Southeast, east, northeast, and north are not prevailing winds and have comparatively little influence on our climate, but when we do have a northeast wind blowing from the mainland in winter or spring, as we had for a week or ten days in March of 1906, the temperature drops several degrees below freezing and the change is felt keenly. In summer the north wind, blowing over a heated land surface, is our warmest wind. There has been an occasional cold winter, with considerable snow, notably 1893, but it is unusual and has little effect on the average temperature of a number of years.

I would suggest, therefore, that among the factors which modify the climate of Victoria, giving us our mild winter, warm summer days, and cool summer nights and a minimum precipitation, are the following:

1. Our insular position.
2. The very uniform temperature of the Pacific to the west of us.
3. Prevailing westerly winds, with free access.
4. High mountain ranges situated at such a distance that but little of the precipitation caused by them extends to Victoria.
5. The Olympic Mountains, modifying the south winds and precipitating their moisture there, so that these winds reach us cool and dry.
6. Slight precipitation throughout a large portion of the year, permitting abundant sunshine during those periods.

I may add that the climate of Victoria during July and August of last year (1906) reminded me very much of that of the Nile Valley during the months of January and February. The rays of the sun were about as hot, the air as dry, the nights as cool, and there was so little rain that it was hardly noticeable.

[1] Report of the Chief of the Weather Bureau, 1897-8, p. 270-2.
[2] Canadian Meteorological Service Summary up to 1902.
[3] U. S. Weather Bureau Summary, 1905.
[4] Victoria Station, Canadian Meteorological Service, 1905-6.
[5] Canadian and U. S. Weather Bureau Summary, 1905.

"SCENES FROM EVERY LAND"

THE National Geographic Society will probably publish about September 30 a volume of from 160 to 200 pages, containing the more striking and instructive of the many pictures that have been published in the Magazine during the past several years. The Society has received many requests from members and others desiring copies of certain of our illustrations, which we have been unable to satisfy, owing to the fact that practically all of the numbers are out of print. It is planned to include in this book pictures representing every part of the world, as well as subjects of general geographic interest. The volume will consist entirely of illustrations, with from six to ten lines of explanatory text beneath each picture, and also contain a bibliography of several pages of the standard books on different parts of the world and geographic subjects, including natural history.

In order that the Society may know in advance how many copies the members may demand, it is requested that every member desiring copies will fill out the blank form printed on another page and return it as soon as possible. The price of the volume will be $1.00, and will be sent only to members subscribing for it. The volume has been prepared by Gilbert H. Grosvenor, editor of the NATIONAL GEOGRAPHIC MAGAZINE.

PHOTOGRAPH OF OIL WELL NEAR OIL CITY, PENNSYLVANIA

WHEN a well is drilled into the oil-bearing sand a charge of nitroglycerine, from 10 to 200 or more quarts, is lowered into the well and exploded, to open up the sand. This results in a better flow of the oil into the well, and as a rule materially increases the production. The accompanying photograph shows the effect, at the surface, of the discharge of 30 quarts of the explosive at a depth of 438 feet.

—*S. A. Cornelius, Oil City, Pa.*

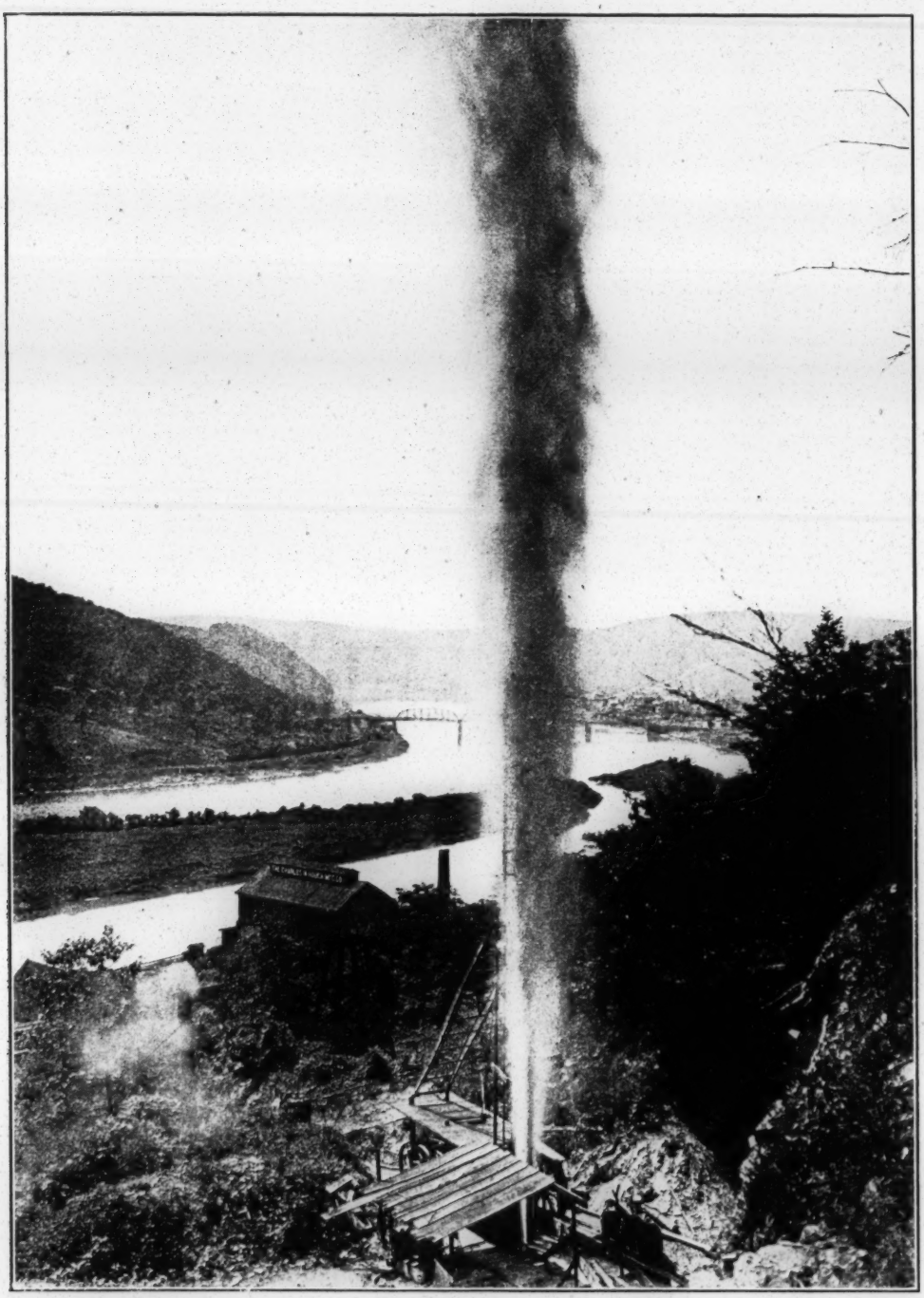


Photo from S. A. Cornelius

A Vigorous Oil Well, Oil City, Penn.

Making Salt in China

The salt sea water is pumped by these windmills into shallow ponds, where it evaporates

ECHOES OF THE SAN FRANCISCO EARTHQUAKE

By Robert E. C. Stearns, of Los Angeles

DURING the excitement incident to the San Francisco earthquake various rumors were in the air for several days, some without the slightest foundation, others exaggerations of some comparatively trifling fact, repeated from mouth to mouth, magnified and distorted with each repetition. As an illustration, it was stated that the well-known Cliff House "was thrown into the sea and not a vestige left," when in fact it was damaged to the extent of a few hundred dollars. In the following *October* we read of the *April* quake that observers in many places on the coast "noticed geysers of heated liquids ejected high out of the horizon line." It is not altogether improbable that oceanic or suboceanic disturbances caused by seismic or volcanic action may have occurred, but my efforts to trace to a definite source the statement referred to have been unsuccessful. This, like the Cliff House rumor, may be due to an overheated imagination.

The keeper of the Point Pinos Lighthouse Station, near Monterey, writes: "I did not see or hear of any disturbance of the sea at the time of the earthquake of April 18, other than that persons on board a ship entering the harbor supposed they had struck a rock."

Captain McCollough, bar pilot, who was bringing the collier *Wellington* in from the sea on the morning of April 18, is quoted as follows by a San Francisco paper: "We were off Diablo,* in about fifty fathoms of water, when the earthquake shock shook us up. The *Wellington* shivered and shook like a springless wagon on a corduroy road. The sensation at first was as if the big steamer was jumping from one gravel bed to another, and it seemed as if she would jar her insides out. As the shaking gained in intensity, it seemed as if she was blowing out boiler tubes, an explosion every second. It was a terrifying experience, and none of the uncanniness was taken off by the fact that the sea was as smooth as glass and showed not a ripple when the shaking was at its worst."

Since the earthquake the pilots have made extensive soundings on the bar and so far have found no changes in the depths. No sweeping or unusual wave occurred along the coast, at least none was mentioned in the papers at the time, though possibly there may have been some quite local movement of the sea at places along the shore of Mendocino and Humboldt counties.

A high wave, it is stated, washed out two buildings at Moss Landing, in Monterey Bay, and the shore at that point was reported to have sunk six feet. If so, it cannot properly be attributed, directly or indirectly, to oceanic disturbance, but to limited local movement, being in line with the general northwesterly and southwesterly trend, which included Hollister, Castroville, Salinas, and other near-by towns and villages in Monterey County, and southward to San Juan, in San Benito County, where the old adobe mission church of San Juan Bautista was seriously damaged.

Of the effects of the earthquake on marine life, we have barely a scrap of information. The following is not without interest: There are several parties of Japanese engaged in the Abalene (Hali-

* Point Diablo is on the northerly side of the entrance to San Francisco Bay, between Point Bonita (westward) and Lime Point (eastward), and just a trifle more than one statute mile from Fort Point, on the opposite shore. It rises sharply to 900 feet in about three-quarters of a mile; has strong current rips close around it, and is the *bête noire* to all navigators.—Davidson.

The Devil's Post Pile

Ancient lava which has spilt into columns. In the Sierras

otes) fishing along the main shore, as well as on some of the islands in the Santa Barbara Channel, working one place after another as long as each locality continues profitable and using a diving suit in pursuit of the business. It was stated at the time that a party of Japanese, with headquarters on Carmel Bay (a few miles south of Monterey Bay), left early in August last for the coast of San Luis Obispo County, with the intention of collecting abalenes near Morro Rock. In the following October it was reported that the expedition proved a failure, not because of a scarcity of abalenes, for they were found to be in great abundance, but for miles along the shore they were all dead. The ocean bed was covered with an oily, bituminous slime, or something of the kind, presumably due to the earthquake on April 18, and fatal to the shell-fish.

The discharge into the sea of poisonous matter, whatever its character, may have occurred before or since the quake of April 18, and the disturbance, whenever it occurred, may have been comparatively local and restricted to a limited range along the main shore.

The postmaster at Morro informed me that the shock of April 18 was very slight at that place—so slight that "some people were not awakened by it."

Point Pinos is about 90 miles south of the entrance of San Francisco Bay, and Morro is 100 miles south of Point Pinos.

FOR TEACHING PHYSIOGRAPHY

THE United States Geological Survey has selected a list of 100 of its atlas sheets for the purpose of illustrating a variety of physiographic forms. This has been published as a leaflet, giving under each sheet the principal physiographic form or forms which it illustrates, and with this list is a cross-reference list showing the sheets on which each topographic form is illustrated. For instance, aggrading streams are illustrated on the Maxwell (Cal.) sheet, alluvial fans on the Cucamonga (Cal.) sheet, anticlinal mountains on the Cloud Peak (Wyo.) sheet, denuded plateaus on the Corazon (N. Mex.) sheet, dissect fault blocks on the Needles (Ariz.) sheet, glaciated topography on the Becket (Mass.) sheet, lacustrine plains on the Amargosa (Nev.-Cal.) sheet, kettle moraines on the Edgely (N. Dak.) sheet, wind erosion on the Coldwater (Kans.) sheet, etc. These atlas sheets, with the aid of such a list, will prove very helpful to teachers of physiography.

This set of 100 sheets with the leaflet will be sold for $3 by the U. S. Geological Survey, Washington, D. C.

NEW TOPOGRAPHIC MAPS

The U. S. Geological Survey has recently published topographic atlas sheets of the following quadrangles:

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Elizabeth	West Virginia
Holbrook	West Virginia
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Chandler	Oklahoma
Evansville	Wisconsin
Casadepaga	Alaska
Solomon	Alaska
Colusa	California
Woodland	California
Louisville	Kentucky
Relay	Maryland
Ely Special	Nevada
Lake Pleasant	New York
Cowee	North Carolina–South Carolina
Bristolville	Ohio

Sheet.	State.
Greensburg	Pennsylvania
Piseco Lake	New York
Tupper Lake	New York
New Bloomfield	Pennsylvania
Thornton	West Virginia
Kirwin	Wyoming

New editions have also been printed of the following sheets:

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Burlington	Pennsylvania–New Jersey
Pisgah	North Carolina–South Carolina

The price of these atlas sheets is five cents each, or $3 a hundred. Payment should be made in cash or by postal money order, payable to the Director of the U. S. Geological Survey, at Washington, D. C.

Two Years Among New Guinea Cannibals—By A. E. Pratt. Illustrated. Pp. 350. 6 x 9 inches. Philadelphia: J. B. Lippincott Co. 1906.

This book is a fascinating narrative of a naturalist's sojourn among the aborigines of unexplored New Guinea, and reminds one very much of some of Du Chaillu's stories of exploration. The illustrations are exceptionally good. Some of the author's descriptions, however, have to be taken on faith; for instance, the story of the fishing net which is woven by spiders. According to Mr Pratt, the natives, when they want a fishing net, set up in the forest a bamboo pole, bent into an oval form. After a short while they return to find that the spiders have covered it with a web which is so tough that it makes a perfect fishing net. The book gives several illustrations of this fishing net and shows the natives dipping in the streams with them. It should be noted, however, that the illustrations are not from photographs.

The Burton Holmes Lectures. By E. Burton Holmes. 10 Vols. Pp. 4,000. 10 x 7½ inches. Illustrated. New York: McClure, Phillips & Co.

Vol. 1. Into Morocco; Fez; The Moorish Empire.
Vol. 2. Round about Paris; Paris Exposition, 1 and 2.
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Mr Holmes as a writer has a decidedly graphic style and a genius for vivifying his narrative. The reader seems to board the train or caravan and travel along in his company, roughing it a bit now and then as well as enjoying the journey, finding and exploring curious out-of-the-way places and mingling with motley throngs in the bazar of an ancient and romantic Moorish city, or peradventure talking with a group of bearded Cossacks while en route over the Trans-Siberian Railway, as the case may be.

The travelogues are splendidly bound, printed on very good paper, and are a most valuable addition to any library. J. O. I.

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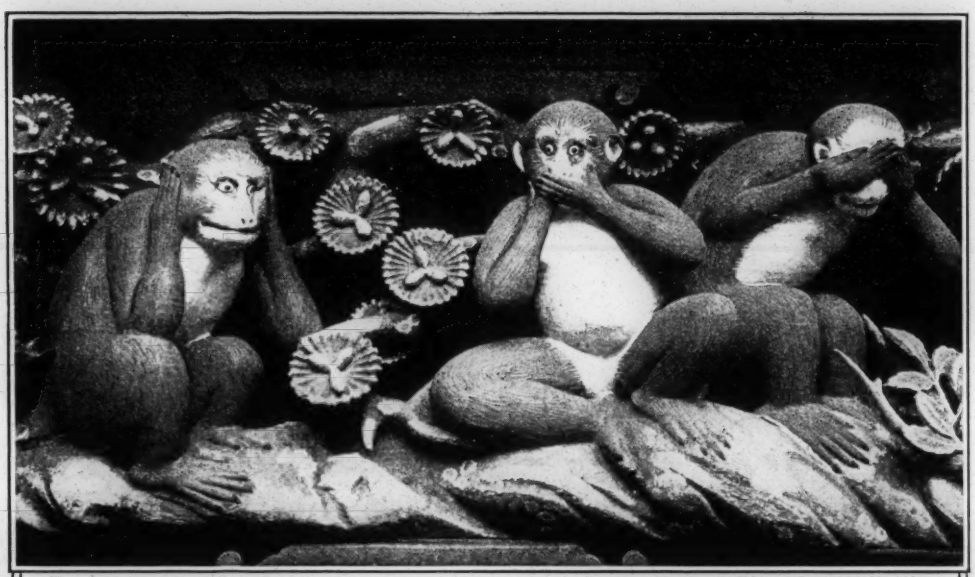

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This Group of Monkeys Represents a Favorite Maxim of the Japanese:
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SCENES FROM EVERY LAND

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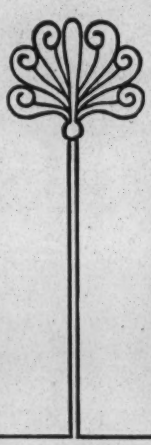

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